Henry C. Pearson, F. R. G. S., Founder

Edward Lyman Bill, Publisher

INDIA RUBBER WORLD

William M. Morse, Editor

B. Brittain Wilson, Business Manager

Volume 88 | July, 1933 | Number 4

Contents

Articles

Departments

Departments

Published monthly by Bill Brothers Publishing Corp., 420 Lexington Ave., New York, N. Y. Other Bill publications are: *Draperies, Novelty News, Radio Merchant, Rug Profits, Sales Management, Soda Fountain,* and *Tires.* Cable address: ELBILL, New York. Subscription $3.00 per year postpaid in the United States; $4.10 per year postpaid to Canada; $3.50 per year postpaid to all other countries.

INDIA RUBBER WORLD

Published at 420 Lexington Avenue, 400 Graybar Building, New York, N. Y.

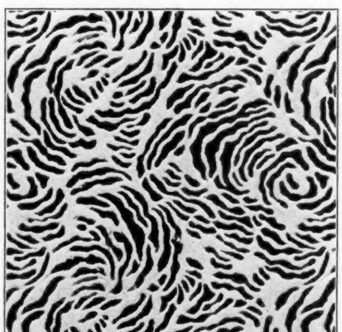
Volume 88 | New York, July 1, 1933 | Number 4

Embossing Fabrics

Relief Ornamentation of Rubber Fabrics — Leather Grains and Designs — Roll and Plate Engraving—Paper Roll Construction—Embossing Calenders and Presses

Webster Norris

EMBOSSING is the art of ornamenting surfaces of sheet material with designs in relief. It is accomplished by raising or depressing a figure or design on a surface by pressure. See Figure 1. The material must rest on an underlying support, either of metal with depressions cut where the die is raised or of some soft material into which the die can press the embossed material. The pressure necessary for embossing may be applied between the rolls of an embossing calender or by a powerful press of special construction. Both of these means are employed in the case of rubber coated fabrics. Embossing fabric in rolls is much more rapidly done by calender than by press and in rubber work is more generally used.



Thos. & Geo. M. Stone, Inc.

Fig. 1. Embossed Design

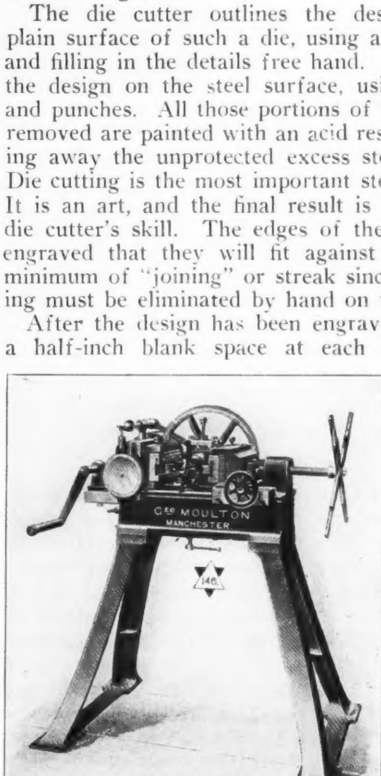
The essential operating features of an embossing calender are the engraved steel roll and its matrix counterpart, the paper roll. The details of making these rolls are of particular interest in view of their importance in securing good embossing and machine service.

Roll Engraving

Roll engraving begins with transference of the design to the master die or miniature roll carrying one "repeat" of the pattern. The die corresponds in circumference and length with the dimensions of the repeat of the design.

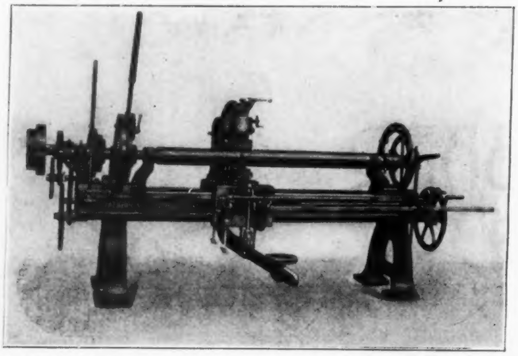
The die cutter outlines the desired pattern on the plain surface of such a die, using a transparent tracing and filling in the details free hand. He then works out the design on the steel surface, using chisels, gravers, and punches. All those portions of the design not to be removed are painted with an acid resisting varnish, etching away the unprotected excess steel with nitric acid. Die cutting is the most important step in roll engraving. It is an art, and the final result is dependent upon the die cutter's skill. The edges of the repeat must be so engraved that they will fit against each other with a minimum of "joining" or streak since all traces of joining must be eliminated by hand on the engraved roll.

After the design has been engraved to proper depth, a half-inch blank space at each end of the die is "snagged," or in other words indented with a large number of angular punch marks resembling the surface of a wood rasp. On one end of the die a single snag punch is made circular instead of angular to provide a reference point for correctly positioning the die in its successive applications in transferring the pat-



Geo. Moulton, Ltd.

Fig. 2. Clam Machine



Frédéric Schultz

Fig. 3. Roll Engraving Machine

tern to the "mill." The angular snagging serves as gear teeth to rotate the die and mill in unison.

John Waldron Corp.

Fig. 4. Paper Roll Press

The "Mill"

The mill is a steel roll of the same dimensions as the die. The impression of the engraving is transferred in reverse to the mill by running die and mill snagged together in a small machine known as a "clam," illustrated in Figure 2. Most of the forcing of the die against the mill is effected by pressure exerted by a weighted lever system or a hand screw. The excess metal on the mill is removed by etching. Areas not to be etched are protected by a "resist," a pasty wax mixture, a slight amount of which is applied to the surface of the mill each time die and mill are run together. Alternate running and etching follow each other until the complete design is transferred to the mill, making the latter the opposite of the die. In other words the contour of the mill is the same as that of the finally embossed goods.

After the design is fully transferred to the mill the snagging of the latter is turned off, and the ends trimmed to insure good joining of the repeat at the sides. The mill is then hardened, ready for engraving the steel calender roll. When the repeat of the pattern is small and the engraving is delicate, 2 repeats are applied side by side on the die.

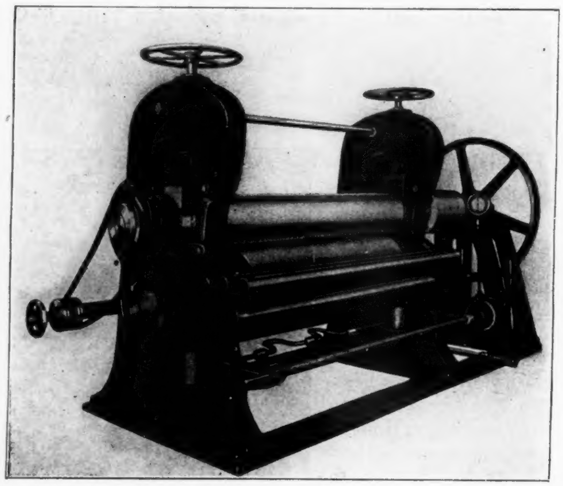
Engraving the Roll

The finished mill having been hardened, the work of engraving the roll proceeds in an engraving machine as shown in Figure 3. Since the circumference of the roll must be a multiple of the circumferential repeat of the pattern, the die and the mill are laid out to suit the roll size. The roll, made from forged steel in one piece, should be of the highest quality for the work proposed for the sake of economy and good work.

The roll to be engraved is placed in the machine and is revolved in solid bearings. The mill by which the design is engraved on the roll surface is held in bearings on top of the roll. As the latter revolves, the mill is pressed into it by means of a system of levers and weights. The mill is shifted across the roll surface one repeat at a time until the entire face is engraved. All excess stock is removed by etching through a wax resist applied to the roll face. The pattern is thus brought gradually up across the whole surface of the roll. Before the roll is ready to be placed in a calender to emboss goods the joinings where the repeats come together are retouched by a hand engraving tool to correct any defects in matching the design.

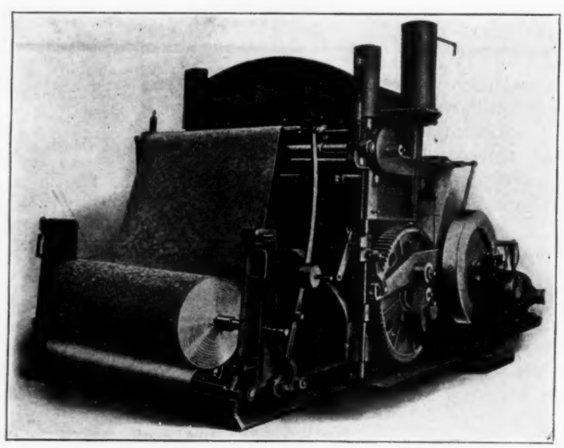
Paper Roll

The paper or matrix roll is equally important with the engraved roll. It is made of sheets of special paper assembled on a shaft and compressed under extremely heavy pressure until the sheets form a marble-like roll after being finished. The enormous press pictured in Figure 4 is one used in making paper rolls. It is capable of exerting a pressure of 2,000 tons. A certain number of sheets are assembled and the press brought down, pressing them together into a fraction of that first occupied. When the paper has reached the height of compression, it is held there, and another lot of paper is applied. Thus the process is continued until enough sheets of paper have been pressed together to form a paper roll. It is then held under heavy pressure a sufficient length of time, after which steel heads are put on each end and locked to the shaft to hold the paper under this enormous pressure.



The Textile-Finishing Machinery Co.

Fig. 5. Embossing Calender

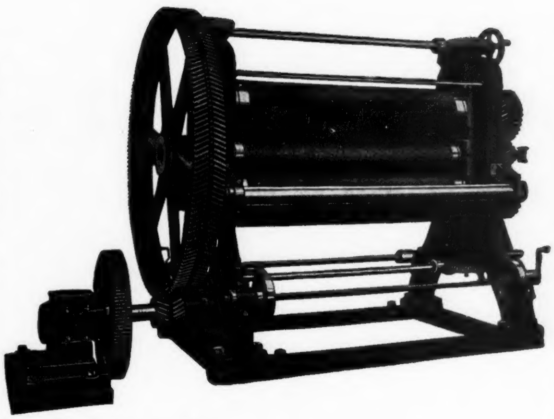


T. W. & C. B. Sheridan Co.

Fig. 6. Embossing Press

Embossing Calender

In the embossing calender illustrated in Figure 5 the upper or engraved steel roll is the die and the lower or paper roll is the matrix. Preparatory to embossing, the design on the steel roll is impressed into the paper roll by running the 2 rolls together under pressure while the paper roll is softened by wetting with water. When a fabric is passed between these rolls under pressure, the matrix roll accommodates the face of the goods to the contours of the engraved roll surface, thus registering the embossed effect. For embossing fine details it is essential that the paper roll receive and retain on its surface a full counterpart of the details on the engraved roll. The perfection of the embossing depends in great degree on the skill and judgment of the operator and the speed of the machine.



Farrel-Birmingham Co., Inc.

Fig. 7. Embossing Calender

Embossing Press

The application of leather grain to the surface of rubber-fabric artificial leather is done by special toggle presses of the type illustrated in Figure 6, which represents one of the largest presses built for embossing. The conforming head is arranged to adjust itself by heavy car springs to any unevenness of the material or depth of engraving on the die plate. The latter is made of 5/16-inch steel. Prior to engraving, the plate is curved to cylindrical form, thus permitting it to be engraved in the same sort of machine by a mill in the same manner as a roll. Engraved plates are made of sizes to suit the press heads, for example, 54 by 24 inches, 56 by 30 inches, 60 by 36 inches, and 72 by 36 inches. A press like the one pictured for operating a plate 72 by 36 inches weighs 100,000 pounds, and the enormous pressure of 500 tons must be exerted before the machine starts to compress.

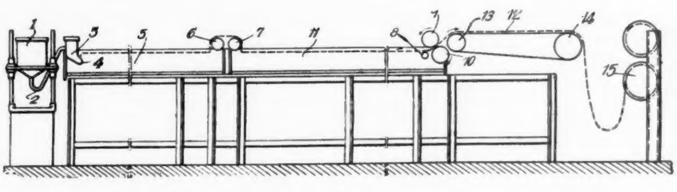
In press embossing, the matrix consists of a pad of special paper located on the bed of the press; the engraved plate is attached to the top of the press.

The press is much slower than the calender, but gives higher relief because of the heavier pressures.

Golf Ball Winding Tape

New Type Calendered Latex Product

FLAT or tapelike filaments or threads suitable for use in golf-ball manufacture are made direct from partially set filaments, threads, or tubes of rubber, produced from aqueous rubber dispersions by an improved process.[1] According to a previous patent by the same inventors[2] an aqueous dispersion is caused to flow through nozzles of any desired shape into contact with a liquid dehydrating and setting medium operating partly or entirely under continuous penetrative osmotic action.



Apparatus for Producing Flat Thread by Extrusion of Aqueous Rubber Dispersions

The dispersions employed may be natural latex of rubber, balata, gutta percha, or similar vegetable resins, or artificial aqueous dispersions of coagulated rubber, vulcanized rubber, reclaimed rubber, etc., in concentrated or compounded condition or, alternatively, in a condition obtained by compounding and concentrating the ingredients usually added, such as fillers, reenforcing agents, vulcanizing agents, accelerators, and softeners.

The consistency of the dispersions is adjusted to the consistency of a fluid cream supplied from a container indicated in the illustration at *1* through a pipe *2* to a feed tank *3*, and is allowed to issue through a jet *4* of any desired shape or area immersed in a dehydrating or setting bath *5*.

The "fluid head" of the cream relative to the jet orifice is sufficient to cause a slight positive flow from the jet. As the dehydrating and setting liquid has a higher specific gravity than that of the latex cream, the latter tends to rise from the orifice continuously in a vertical direction in the heavier medium. The level of the jet below the surface of the bath is adjusted to insure a satisfactory degree of setting of the vertically rising cream before it reaches the surface. The bath liquid is preferably a warm concentrated solution of a saline or other very soluble substance. It is apparently the osmotic effect of the solution which leads to the dehydrating and setting action mentioned.

The thread is drawn through the bath onto the rollers *6* and *7*, passing into a washing tank *11* containing hot water. It is drawn from the opposite end of the tank by the roller *8*. At that point the thread passes between the even speed rubber-covered rollers *9* and *10*, which are adjusted to flatten the thread to the desired degree. After the partially set thread passes between these rollers it is received on a conveyer belt *12* carried on drums *13* and *14*, and is then wound on a reel *15*.

The flat or threadlike filament made in accordance with this method is substantially free from the sharp edges and irregularities usually to be found in that produced by the use of a cutting knife and lapping cloth.

[1] United States Patent No. 1,889,102, Nov. 29, 1932.
[2] British Patent No. 311,844.

Rubber under Tension[1]

And Its Function as Thread in a Golf Ball

I. Torrence Gurman

THE distortion produced by impact, as previously mentioned, results in a change in stress conditions which varies in different parts of the ball. The reaction of the thread is controlled by the modulus *range* of the thread under the range of stresses produced. It becomes necessary, if we are to attain maximum distance qualities in a ball, so to control the winding tension as to obtain maximum mean modulus throughout the ball during this distortion period.

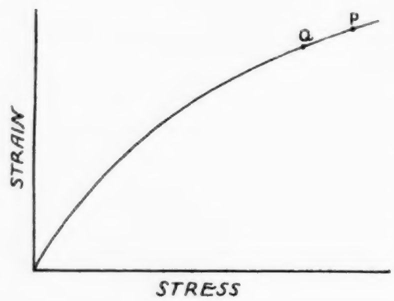


Fig. 1

If we consider only the breaking strength and the corresponding elongation of a thread stock, we are not in a position to determine the behavior of that stock and cannot, in consequence, designate the purpose for which the stock is best suited.

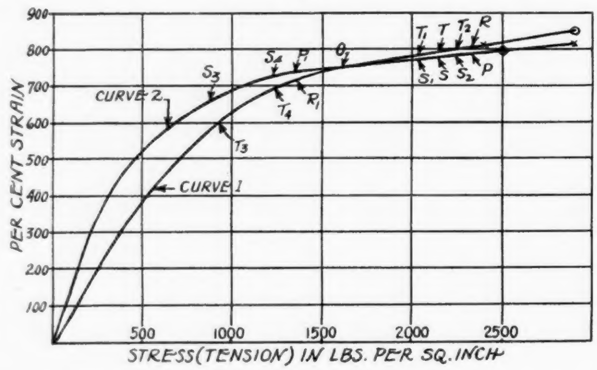


Fig. 2

This point will be clearer if we consider Figure 2. Before doing so, let us suppose a thread to be wound at a stress represented by the point P in Figure 1. Now, if transverse forces be applied, the modulus is lowered, and while we do not actually experience the condition that exists at Q, we do obtain a modulus equivalent to that at, say, the point Q. For our purpose we may represent the new condition by the point Q.

In Figure 2 Curve 1 is the stress-strain curve for thread No. 1, and Curve 2 that for thread No. 2. These curves follow different paths, representing different characteristics, intersect at the point O equivalent to 750% elongation and a stress of 1,600 pounds per square inch and have breaking stress of 2,400 pounds per square inch and 2,900 pounds per square inch and elongations of 815% and 830% respectively. Suppose the threads are wound under conditions indicated by P and R; then, allowing for transverse forces, we obtain conditions corresponding to S and T, with active ranges (during impact) of S_1S_2 and T_1T_2. It is apparent that the mean modulus in the S_1S_2 range is greater than that in the T_1T_2 range. If, however, the thread were wound under conditions indicated by P_1 and R_1 with corresponding ranges of S_3S_4 and T_3T_4, the modulus in the T_3T_4 range would be greater than that in the S_3S_4 range. Thus we find that of the 2 threads compared one gives us a higher modulus under one set of tension conditions, while the other gives us higher modulus under different tension conditions. Hence different threads are adaptable to different purposes, and, conversely, different types of balls require different threads. Thread No. 2, for example, is the more suitable for a distance type of ball; while thread No. 1 is the more suitable for a tough ball. It will be noted that the breaking stresses and elongations of the threads played no part in our determination. It would not have mattered if these values had been 2,900 pounds at 850% for Curve 1 and 2,500 pounds at 800% for Curve 2 (see circles on Curves 1 and 2) instead of the original values (see crosses on the curves) *provided the characteristics of the curves between the critical points of the curves and the points of applied (initial) tension, P and R or P_1 and R_1, remain the same.* The breaking stress is, naturally, of consequence in determining the safety factor in the proper operation of the winding equipment and the limitations to be placed on the initial winding tension.

All of this, of course, leads us to the suggestion that golf ball manufacturers use different types of thread for different types of balls to obtain uniform and optimum results. This suggestion will be met by 3 attitudes on the part of the consumers (and maybe the manufacturers) of golf ball thread, typified by the following:

"The suggestion is good and should be adopted."

"There may be something in the suggestion, but its adoption would only make operations more complicated;" and last, but least commendable, "Why that's just what we've been doing right along!"

The author hopes that the first will be in the majority. The adoption of this suggestion will eliminate much of the guesswork and variations in the behavior of *nominally* similar, but actually different products in a plant. There is no doubt that various "types" of thread have been used in the past, but without any discrimination as to their applicability for different types of balls *based on their physical characteristics.* The "better grades," more truthfully defined as the more costly

[1] Continued from INDIA RUBBER WORLD, June 1, 1933, pp. 37-39.

grades, and the finer cuts have been adopted for use in the higher priced balls, without consideration for the ultimate purpose for which these balls were intended. The "lower grades," or cheaper grades, and the coarser cuts have been adopted for use in making lower priced balls for the sake of economy in material and operating costs. Apart from this point no real distinction has been made or suggested, or, if it has, it has been done *sub rosa* and kept a deep, dark secret. Nor is the author overlooking the fact that so called "special" thread has been supplied to certain manufacturers, since the only claim these threads have to their title is based on a change in curing conditions (or compound, or both) to enhance aging properties.

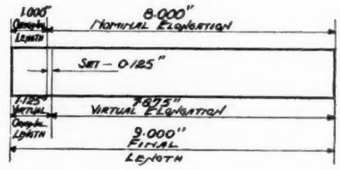


Fig. 3

Now aging qualities in a rubber stock are as a rule a valuable and important asset, and golf ball thread cannot be considered an exception to this rule. The importance of this quality and the benefits to be derived therefrom in the case of golf ball thread are not so great, however, as in the case of most rubber products because most of the destructive influences that affect rubber goods and shorten their active life are averted by the molding on of a cover. Because of the cover the thread is protected from the action of light, moisture, and air, and to some extent, that of heat. The value of aging qualities in a thread or thread stock, therefore, is limited to the possibility of storing it for a considerable period in the interval between the curing or cutting of the stock and its utilization in the manufacture of golf balls. After a ball is molded and painted, the chances of its losing its "pep" owing to the effects of oxidation, etc., boil down to the cases where it is lost in play and left to cope with the elements. What concerns the manufacturer most is the loss in liveliness that occurs while the balls are on the shelf prior to their being purchased by the consumer. Consequently the tests run in an aging oven or an oxygen bomb do not duplicate conditions that the ball meets with after it is made and are, therefore, of little value, regardless of whether they are run on either the thread "at rest" or under tension (as in the cases of wound or molded balls). In addition the heat prevents the normal aging of the cover stock.

Another factor, however, plays an important part in this regard. Among the results obtained in the determination of the physical characteristics of a stock is one which is reported "out of habit" or not at all. Even when reported, it is not given much consideration because little importance is attached to it. The factor referred to is the permanent set. When a piece of material is stressed beyond its elastic limit, and the stress is then removed, the material will not resume its original dimension. This condition is due to the distortion of the particle arrangement. A "permanent" strain results and is termed "permanent set." If the piece of material be permitted to lie around for a considerable period, the "permanent" strain decreases, but never actually disappears. In the case of rubber compounds this set, like the elongation, is considerably greater than in the case of most other materials. A permanent set of 10% to 15% of the original length of the test piece (or measured section) subjected to stress is quite common.

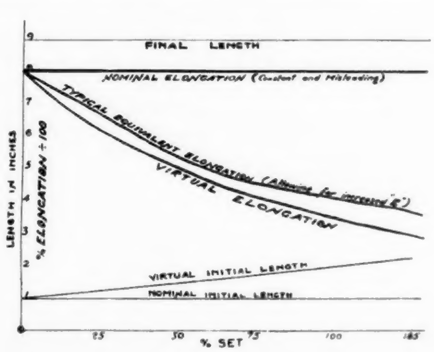


Fig. 4

It may run much higher. The measurement is usually carried out shortly after the test piece is removed from the testing machine, after having been subjected to varying stresses for a relatively short time. In the case of thread subjected to a high degree of tension for a considerable period of time, as is the case in a golf ball winding, the set is much greater. In effect the set results in a condition, which, while differing from that of the transverse forces in nature, is yet similar insofar as the final effect is concerned since it virtually produces a reduction in tension on the windings.

To make this statement clear let us suppose a piece of thread 1 inch long be extended to a final length of 9 inches. See Figure 3. The elongation is then 800%. If the set is 12½%, the virtual length of the original piece is 1.125 inches; the strain is 7.875 inches; and the virtual elongation is 7.875/1.125 x 100% = 700%. This results, in effect, to reduce the stress. The following table and diagram (Figure 4) indicate how this effect increases with the increase in the amount of set.

Nominal				Virtual		
Initial Length Inches	Elongation %	Final Length Inches	% Set	Initial Length Inches	Strain Inches	Elongation %
1.000	800	9.000	12.5	1.125	7.875	700
1.000	800	9.000	28.6	1.286	7.714	600
1.000	800	9.000	50.0	1.500	7.500	500
1.000	800	9.000	80.0	1.800	7.200	400
1.000	800	9.000	100.0	2.000	7.000	350
1.000	800	9.000	125.0	2.250	6.750	300

The extent of this effect is governed by the nature of the stress-strain relation of the stock and is offset somewhat by the fact that the modulus of the extended stock is somewhat greater than that of the original stock. It is for this reason that most latex stocks and many crepe stocks are not to be recommended for golf ball use. The eventual and inevitable result is, of course, loss in modulus (e) and loss in the liveliness of the ball. In some cases the physical effect is so marked that the thread after prolonged subjection to high tension becomes "dead" or stiff and, losing its "elastic" nature, feels and acts more like a piece of jute twine than like a rubber thread (as we know rubber thread); yet this same thread will yield favorable tests as regards aging, breaking stress, and elongation.

What follows in the next few paragraphs is, in the author's opinion, the most interesting as well as the most promising phase of the consideration of the characteristics and behavior of rubber thread. Nor is this behavior typical of rubber thread alone. The principles involved are equally applicable to other rubber compounds and may be extended to apply, in part at least, to other materials, an example of which is quoted below.

Until recently the method of testing a rubber stock to determine the stress-strain relation had become fairly well standardized. More exacting demands on control and specification brought about modifications of the standard methods and equipment to permit the testing of single strands with a high degree of accuracy. As a result some very interesting information has come to light, chief among which is the fact that even as the modulus of a stock increases with the stress (as indicated by the stress-strain curve), so it and the

breaking stress increase with a decrease in the cross-section of the sample tested.

Making proper allowance for such factors as cure and concentration (depending on the type of stock), we are confronted by facts which force us to arrive at the conclusion that the indicated strength of a stock, as determined by the approved methods now in use consists of 2 component parts. These are: first, the intrinsic strength of the stock itself; and second, one or more factors governed by the longitudinal surface area of the sample tested.

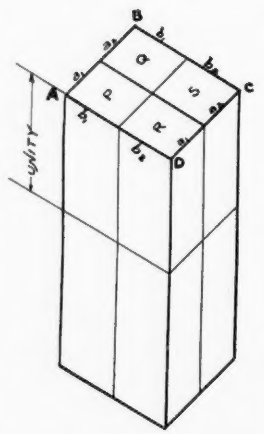


Fig. 5

The surface per unit length, per unit cross-sectional area increases as the cross-section decreases. If, therefore, a material, of parallelogram cross-section ABCD (see Figure 5), be subdivided into sections P, Q, R, and S, then the perimeter of the 4 new sections and the sum of *longitudinal* areas are greater than those of the original areas. If $a_1 = a_2$, and $b_1 = b_2$, the new values are twice as great as the original ones; and if the area of ABCD be unity, then the *surface area* (longitudinal) *per unit length per unit area* is also twice that of the original. If ABCD is 1 inch square, the total area per unit length (1 inch) is 4 (1 inch by 1 inch) = 4 square inches. That in 4 sections ½-inch square is, per unit length, 4 by 4 (1 inch by ½ inch) = 4 by 2 = 8 square inches. If then AB and BC each be divided into *m* equal parts, as in Figure 6, and lines be drawn parallel to BC and AB at the division points, we obtain m^2 equal sections, the sides of which are in the same proportion as those in the original section ABCD. The sum of the perimeters is *m* times that of perimeter ABCD, and the surface per unit length per unit cross-section (abbreviated to read "s/1/a") is *m* times that in the original section. Similar mathematical relation can easily be deduced between any other sections, circular, elliptical, polygon, etc., the dimensions of which are in the same proportions (and in the case of angular sections, the angles of which correspond).

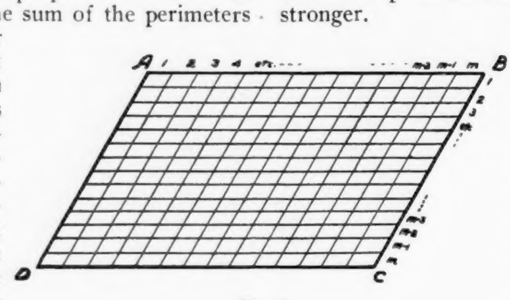


Fig. 6

The general condition may then be expressed in the statement that "the ratio between the s/1/a of stocks of proportional cross-sections is in *inverse* proportion to the ratio of their corresponding dimensions." For example, if ABCDEF and GHIJKL in Figure 7 be 2 such sections, then the s/1/a of ABCDEF is to that of GHIJKL in the ratio GH/AB, or HI/BC or GJ/AD, or any other corresponding dimensions.

When the sections are not proportional, the relation will, of course, be different, but can easily be calculated. In the case of a No. 50 square cut (0.020-inch square) the s/1/a is 50 by 4 = 200 square inches. A thread 1/16-inch by 0.016-inch has a perimeter of 2 (0.0625-inch + 0.016-inch) = 2 by 0.0785 = 0.157-inch; and since the area is exactly 0.001 square inch, the s/1/a is 157 square inches. An extremely fine stock with a cross-section of 1/16-inch by 0.001-inch has an s/1/a = 2,032 square inches.

If, therefore, the s/1/a value has any bearing on the indicated strength of a stock, and the s/1/a values differ in such great amounts, we should be able to observe this effect quite easily. This we can do! If we compare 2 stocks such as the last 2 named, having s/1/a values of 157 and 2,032, we find in the former case an indicated breaking strength in the range between, say, 2,200 and 3,000 pounds per square inch; while in the latter it is of the order of 6,000 to 9,000 pounds per square inch.

Two explanations are offered here for this variation, and they are necessarily bound up in the value of the s/1/a. In the end we may probably conclude that there is but one explanation, but that it includes 2 factors. The first of these is surface tension. As a rule we connect surface tension with liquids only and regard it as a quality or property intrinsic to liquids alone. The author claims it also for solids. To keep peace in the family, especially between himself and the physical-chemists (some of whom may also be physical culturists), he will, however, limit his claim, for the present, to such materials as (soft or semi-soft) rubber compounds, which may because of their peculiar nature be regarded as semi-, pseudo-, or pseudo-semi-liquids.

The other factor has already been referred to at considerable length, but from a different standpoint. It is the effect of transverse forces, which in this case is brought about by the atmospheric pressure. The transverse forces tend to make the stock denser (from a molecular point of view) and consequently tougher and stronger.

To bring out more vividly the extent of the pressure under these and other comparable conditions, let us consider 2 extreme conditions. In the case of a bar of rubber 1 inch square the indicated strength is practically all intrinsic. On this bar s/1/a = 4 square inches, and the pressure per unit length per unit cross-section is therefore 4 by 14.7 lbs. = 58.8 lbs. In the case of the fine strand mentioned above, the s/1/a is 2,032 square inches, and the transverse force is 2,032 by 14.7 lbs. or about 15 tons, which has an undoubted effect on the indicated strength of the stock. This factor alone might quite easily account for the increased indicated strength. Just as easily, however, might the surface tension account for it since an added indicated strength of even 6,000 pounds per square inch requires only a "surface-tension-equivalent" of 3 pounds per square inch. Just how much each factor accounts for cannot at this writing even be suggested. Before the relation can be established with any degree of accuracy, considerable experiment must be conducted to find out the effects of such forces as pressure, temperature, solvent action, etc. For our purpose, here, it is sufficient that these conditions exist, because they evidence the fact that the indicated strength and modulus of a stock depend not only upon the composition and cure,

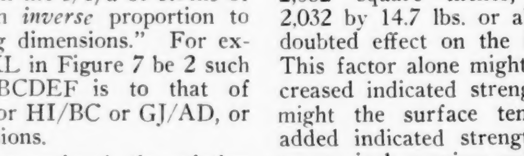


Fig. 7

(*Continued on page* 34)

Rubber Machinery — II

Calenders — Electrical Drives and Control — Incidental Equipment Necessary for Operating, Accuracy, and Control

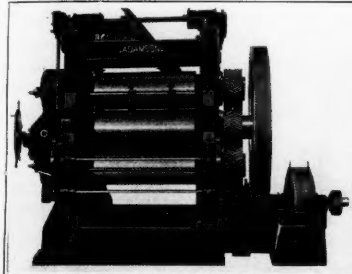


Fig. 1. Adamson 66-Inch 3-Roll Calender

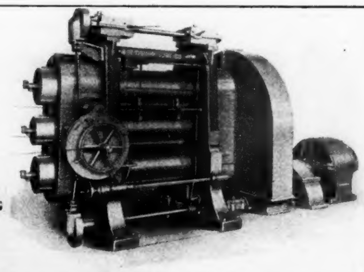


Fig. 2. Thropp 40-Inch 3-Roll Combination Calender

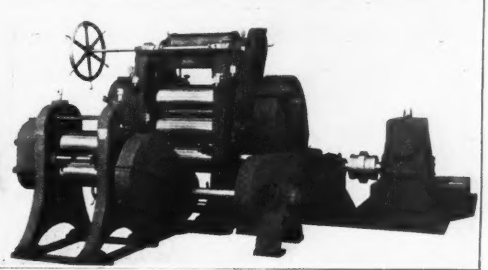


Fig. 3. Farrel 4-Roll Sole Calender with 2-Roll Feed

THIN sheeting of rubber stock, frictioning fabrics, and coating rubber to gage on fabrics are accomplished by calenders of various types, differing in design and operation according to the nature of the work. While calenders are thus the central feature of the equipment, other machines and accessory appliances are indispensable for quality production.

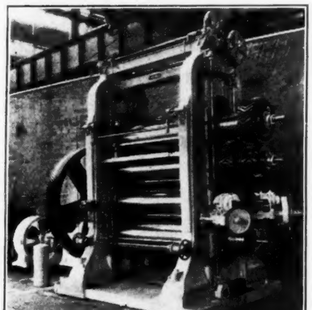


Fig. 4. Farrel 78-Inch 4-Roll Vertical Type

Although every calender consists of a geared and motorized set of rolls, calenders are classified according to number of rolls and the type of work. They are built with any number of rolls from 2 up, according to their intended purpose. The ordinary 3-roll calender is used for friction work, when geared differentially, and for sheeting and coating to gage when geared even motion. Four- and 5-roll calenders are of more varied design for special work such as building up sheet rubber in plies, running engraved stock, shoe soling, tire treads, and other so-called profiling work, running thread sheet rubber, and coating fabrics, cords, etc.

It is extremely important that calenders, like all basic machinery in a rubber mill, be of ample proportions and well designed for ease and accuracy of operation. These and other features are embodied in the calenders illustrated in Figures 1 to 6, inclusive.

Calender Types

Figure 1 shows the front or feeding side of a 66-inch 3-roll even motion calender. It has an overhead I-beam extending front and rear as a support for a hoist to handle roll stock.

A 3-roll combination calender for friction or even motion work is represented in Figure 2. This machine is equipped with dynamic braking safety stop, operated by cross-bars in front of rolls and cables along the side of frames. This equipment is used in case the operator is caught in the take-ups or between the rolls. One of the latest improvements on this calender is an electrical roll raising and lowering device. It is operated by a foot push button so that the operator can regulate the roll while gaging the stock. This is done by a reversible motor control.

Figure 3 illustrates one of many special types for rubber work. This unit consists of a 14- by 32-inch 4-roll soling calender with a 10- by 18-inch 2-roll feeding or slabbing calender in front of it to insure uniform feed of the stock to the soling calender. Both machines are driven by a single direct current, variable speed motor, through a worm gear reduction. A double reduction chain drive from the main drive shaft of the soling calender transmits the power to the 2-roll feeding calender. The soling calender has 3 rolls vertically and a side roll opposite the top roll. It is also equipped with a cooling roll mounted on top of the housings and driven by chain from the top roll.

The vertical 4-roll calender, Figure 4, is designed especially for auto top, raincoat, and similar coated fabrics. It is also used for double sheet work and coating on both sides at one operation. Changing gage between any 2 rolls is effected by a special motor driven mechanism without disturbance of any other adjustment. The gears are all cut herringbone. Roll journals are pressure-feed lubricated, and the motor drive has a pneumatic clutch brake.

Electric Drive and Control

A synchronous motor drive is highly efficient and economical for either mill or calender operation. For example, the one pictured, Figure 5, is a simplified assembly which saves considerable space compared with a coupled drive. The gear unit is of the single helical type, equipped throughout with tapered roller bearings. The motor is controlled by a full voltage starter which embodies a dynamic braking contactor for bringing the

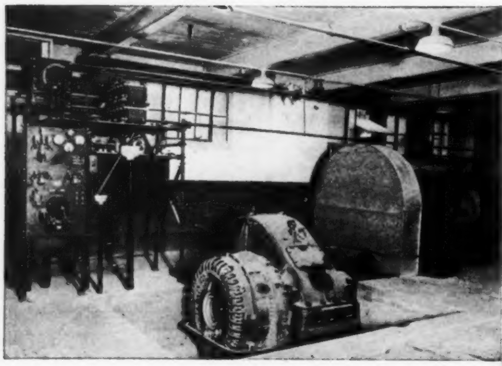


Fig. 5. Westinghouse Synchronous Motor Drive

motor to a quick stop in case of an accident. In an emergency the operator trips a safety switch which brings the motor to a quick stop, with only a few inches of travel on the surface of the roll.

Figure 6 shows an adjustable speed D. C. motor, 200 h.p., 235/950 r.p.m., 125/250 volts with control, driving a rubber calender.

During the past 10 years vast improvements have been made in the contactor design and in the control of automatic acceleration for calenders. A decade ago automatic acceleration was obtained by means of series lockout accelerating contactors, which were also connected in the dynamic braking circuit to give graduated dynamic braking. Owing to the wide load fluctuations on rubber calenders the advantages of time limit acceleration were realized, and the next step was the development of a design that gave time limit acceleration by mechanical means and graduated dynamic braking for quick stop.

Within the past 4 years the development and improvements in inductive time limit acceleration have been applied to rubber calender controls, so that the up-to-date controller incorporates the desirable features of inductive time limit acceleration, which give a smooth uniform start irrespective of the load on the motor. A separate graduated dynamic braking circuit provides for a quick stop when the emergency stop switch is operated.

Stock Shells

Well designed and heavily constructed stock shells are essential for the heavy work and rough handling they must encounter in calender work.

The improved shell shown in Figure 7 consists of a series of corrugated metal members forced into and throughout the entire length of the body interspersed with stamped steel spiders held rigidly in place by the corrugated members. The central tube in the shell guides the mandrel through the shell and helps transmit the torque equally to all parts of the shell.

The depth of the head with its centrally placed web is another important feature, as is the ventilation through the head and spiders to assist in cooling the inner portion of a roll of warm stock.

Another all-metal shell, Figure 8, is constructed of heavy gage sheet stock built around a square tubular center carrying numerous supporting disks to stiffen and unite the exterior cylinder with the central portion. This shell has strength and durability to withstand all requirements. It is so made as to allow the addition of an apron attachment to receive the first end of the liner.

Figure 9 illustrates a group of 3 calender switches used in connection with an automatic control panel for a train of 3 calenders. Except for isolated single calender installations, the 3-wire system is universally used. This system makes it possible to use a 2 to one motor and obtain a total speed range of 4 to one. One half of the total speed range is obtained on each voltage. The calender motor is of 2 types, either speed setting or speed regulating. The speed setting type designates an equipment in which the speed may be adjusted or set independently of the starting device, so that in starting the equipment it will always come up to a predetermined speed, depending upon the setting of the speed regulator, which is commonly a field rheostat.

A speed regulating type is one in which the motor is started at a speed regulated by the same device. It is therefore necessary to regulate or adjust the speed at each start. The advantage of this type is that starting-stopping and speed regulation are all obtained from a single operating lever, to a master controller, and so is simple to operate. A complete calender control equipment consists of a control panel, a master control switch which provides start, stop, and speed regulation on the correct accelerating and dynamic braking resistance, and a calender safety switch.

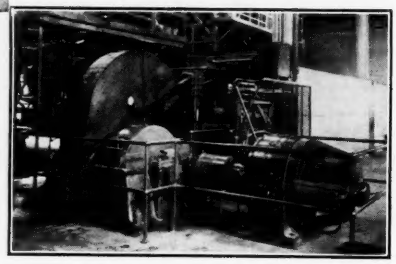


Fig. 6. General Electric Calender Drive and Control

Continuous Weighing Scales

Uniformity of gage or weight is so essential to economy in calender work that most efficient appliances have been perfected for continuously checking these results. The operating principle actuating the weighing scale illustrated in Figure 10 follows: a sheet of flexible material is laid over 3 rollers, all in the same horizontal plane. The weight of the material between the 2 outside rollers will be divided among the 3 rollers as follows: $\frac{1}{4}$ of the total weight will be supported by each of the outside rollers and $\frac{1}{2}$ on the middle roller. Thus it will be seen that if 4 yards of material are between the 2 outside rollers, the weight of 2 yards will be supported by the middle roller. The middle roller is mounted on the Auto-Check mechanism and becomes the weighing or load element of the device, and the reading of the device is the weight of the middle 2 yards of the material. This is true whether the material is moving over the rollers or at rest.

The instrument represented in Figure 11 also is a continuous indicating weighing device, the measurements of which are dependent upon developments in the radio and electrical engineering fields. Thus there is an oscillator and a measuring circuit tuned to it. The degree of tun-

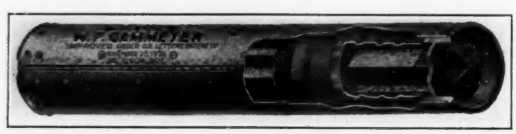


Fig. 7. Gammeter Calender Shell

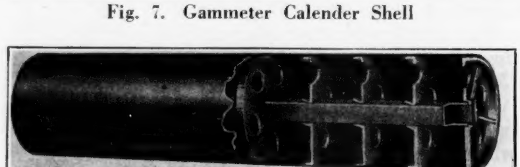


Fig. 8. National Sherardizing Calender Shell

ing between these 2 circuits is governed by the capacity of a measuring condenser in the tuned circuit. The condenser consists of 2 fixed plates between which the rubber passes. Any change in the weight of the rubber changes the capacity of the measuring circuit and likewise the tuning. The amount of current in the tuned circuit varies with the tuning and this current operates calibrated indicators and recorders.

A summary of the features of this instrument follow: (1) its indications represent the weight of the rubber; (2) no contact is made on the rubber while it is being measured; the rubber merely passes between the measuring plates; (3) the measurements are made electrically; (4) the instrument furnishes an easily read record for the guidance of the calender operator and may be adapted to automatic calender control.

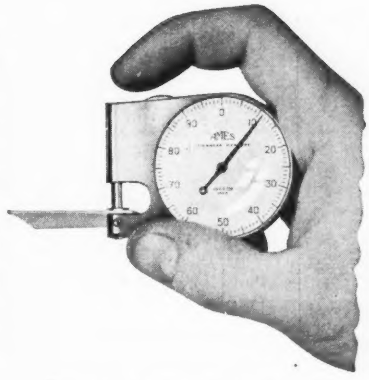


Fig. 12. Ames Hand Stock Gage

Fig. 13. Randall Hand Stock Gage

Stock Gages

Various instruments are available for gaging calendered stock, each of special merit as to accuracy, convenience, etc.

A handy pocket gage for measuring the thickness of sheet materials speedily and accurately is shown in Figure 12. In applying the instrument, the spindle is raised to open the anvils by turning the operating wheel at top. The anvils close with uniform spring tension when the operating wheel is released, eliminating the personal element and giving the same dial readings for all users.

Another convenient dial gage for the calender is pictured in Figure 13. This instrument is designed to stand upon a table or shelf. The dial is graduated in 0.001-inch or in 0.01 mm. if desired. The dial is $1\frac{7}{8}$ inches in diameter and is graduated from 0 to 50. In other words, the measuring range of the gage is from 0 to $\frac{1}{2}$ inch.

The Magnetic Gage

A magnetic operating gage is a recently perfected device for measuring the thickness of progressively advancing material from a calender. It measures thicknesses accurately down to 1/10 of 1/1000-inch. This is new accuracy in rubber measurement. The gaging outfit consists of 3 units: namely, a recording meter panel of the zero center type, a setting device with dial, and a magnetic carriage. The latter is a specially designed electro magnet supported between 2 special steel rollers held slidably mounted on a bar. The latter is mounted across the calender frame in fittings to which it is journaled at each end.

Roll Surface Pyrometers

Several contact pyrometers are used for ascertaining the surface temperature of calender rolls in place of guessing it by touch on the part of the operator. Close regulation of roll temperatures is essential for mixing and calendering high tensile and reenforced stocks to obviate the danger of scorching them in process. Special electrically operated and recording heat instruments, both portable and fixed, are available for this purpose.

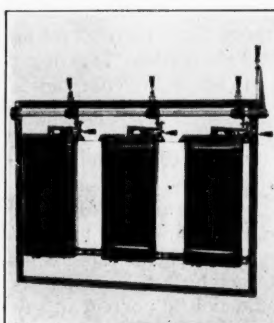


Fig. 9. Cutler-Hammer Calender Switches

Fig. 10. Toledo Continuous Weighing Scale

The one pictured in Figure 14 is of the portable variety and by means of its long handle can be used to test a roll that cannot otherwise be reached conveniently. The device consists of a roll surface couple in combination with a standard portable indicating pyrometer.

A similar instrument also designed for convenience in reading is shown in Figure 15. It comprises an indicator of suitable scale-range having a pair of pointed thermo-couple prods all attached to a base with a convenient aluminum handle. The instrument may be used anywhere with no more effort than pressing the points in contact with a surface to be tested. Instantaneous temperatures of any clean metallic surface such as rubber mill and calender rolls can thus be read.

Another hand instrument for reading the temperature of mill and calender rolls is pictured in Figure 16. This convenient pyrometer is made in a number of models required for its application to various industries. The standard range is from 0 to 400° F. In the rubber industry roll temperatures can be read quickly and accurately, thus closely controlling the narrow heat margin where organic accelerators are used, which, of course, means practically every rubber factory.

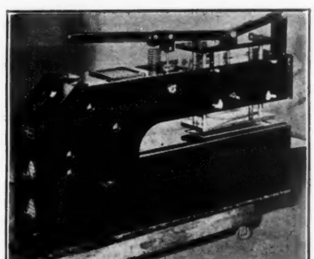


Fig. 11. American Precision Verigraph Weighing Scale

Recording Pyrometers

A pyrometer for recording the roll heat of calenders is illustrated in Figure 17. The instrument may be seen attached to a cross-bar in front of the middle roll of the calender. It is connected with an automatic recording thermometer by which the heat is continuously charted for reference.

A recently devised instrument for indicating and recording relative surface temperatures of mill and calender rolls, called the "air gap" instrument, is represented in Figure 18 as arranged for measuring and recording the heat of a mill roll. A sensitive bulb is built into a cavity of the bakelite bulb holder *A* insulated on the side away from the roll surface so that heat loss to the surrounding air is reduced to a minimum. Frictional heat is entirely eliminated. Means are provided to set the bulb holder against the roll with the least amount of intervening air gap, approximately 1/64-inch. At this distance a

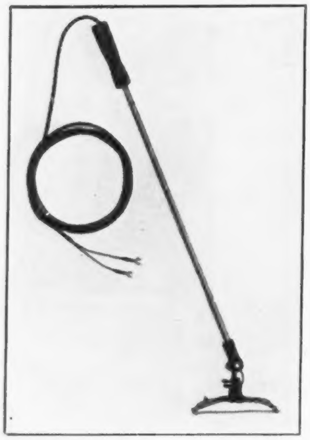


Fig. 14. Bristol Surface Pyrometer

reading only 5 or 10° F. below the actual may be expected. The bulb holder *A* is supported by an arm *D*, counterweighted and free to turn on the shaft *J* bolted at *K* to the calender frame.

Thus mounted, the apparatus may be adjusted at any point along the face of the roll, the temperature of which, as indicated by the bulb in *A*, is charted on the dial of a nearby recording thermometer.

Fig. 15. Illinois Testing Surface Pyrometer

Processed Liners

The fact that freshly calendered unvulcanized rubber is more or less tacky necessitates the use of some means to obviate this source of inconvenience and possible loss. Two methods only were formerly employed in connection with handling calendered stock in rolls. These were surface dusting and rolling in plain cotton liners. The first was available only in the case of a fabric coated one side only; while the second was used for all sheet rubber stocks and fabrics coated on both sides. There are a number of serious drawbacks to the use of plain fabrics. Briefly, they are a source of serious loss of time, labor, and stock; besides they are short lived by reason of becoming torn, sticky, and badly soiled.

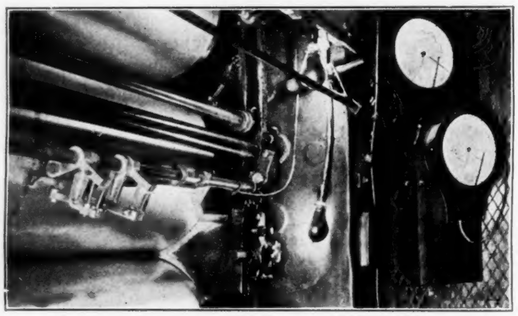


Fig. 17. Bristol Recording Surface Pyrometer

Untreated liners properly handled can be fairly satisfactory and, when past usefulness as liners, may be frictioned for use as cloth insertion in cheap mechanical goods or as matting back.

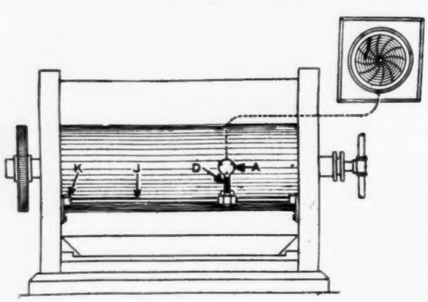


Fig. 18. Tagliabue Recording Surface Thermometer

The annoyances and losses incidental to the use of plain fabric liners are virtually eliminated by the processed liners. These may be of duck, drill, or heavy sheeting, which has been chemically treated or impregnated. They not only retain their strength and pliability, but, when rolled together on a shell with calendered rubber, goods and liner may be unrolled freely without sticking, because of the non-adhesive characteristic gained by processing the liner. Thus the liner leaves the gage of the stock unchanged and is itself preserved for long continued service. Then, too, the liner does not accumulate loose dirt from its contacts in its travels through the various processing departments of the plant.

The idea of processed liners has been extended to include processed paper as well as fabrics. Paper thus prepared is intended for separating or interleaving lightweight friction stocks which are otherwise difficult to handle.

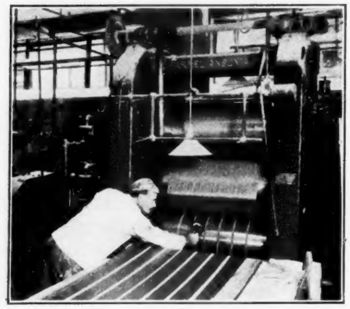


Fig. 16. Cambridge Instrument Surface Pyrometer

(*To be continued*)

Rubber under Tension

(*Continued from page* 30)

but also on the cross-section, or more accurately the s/1/a. This same condition of affairs applies in the case of other materials of extremely small cross-section, as for example, the fine threads or strands from which the spider web is spun; the high s/1/a is largely responsible for the indicated high tensile strength.

The values obtained in the above paragraph were figured on stock "at rest." When the stock is elongated, we have a new s/1/a. Neglecting the slight volume change and assuming an elongation of 800%, we now have a length 9 times the original and a resulting mean diameter[2] (or mean cross-section) of 1/9 that of the original. This has an effect equivalent to dividing the cross-section into 9 similar and equal parts, thus tripling the value of the s/1/a. Since the breaking of a stock of high rubber content takes place at an elongation about that assumed above, the transverse pressure becomes 45 tons/1/a, while the requisite surface-tension-equivalent becomes 1 pound per square inch. . . .

We have already seen that to determine the type of ball for which a thread is most suitable, we must consider more than mere breaking strength and elongation. It is necessary also, in comparing compounds, cures, etc., to test similar gages and cuts, or their equivalents, so that the s/1/a values are the same. Thus if we compared the 2 threads suggested at the beginning of this article and found that the breaking strength of the 1/16-inch by No. 62 was 3,100 pounds per square inch and that of the 1/16-inch by No. 33 was 2,900 pounds per square inch, we would not be correct in saying that the first stock was the better because of the higher indicated strength.

(*To be concluded*)

Sources of Waste in Tire Manufacture—I

Frank Allan Middleton

ERRORS and waste! These 2 words embody the complete forces of evil against which manufacturers have striven since the beginning of industrial enterprise. They represent a colossal burden to manufacturers in the mass and, therefore, to the community at large, the extent of which is difficult to appraise.

Examination of modern production methods would show, however, that most manufacturers are alive to the magnitude of the task of maintaining accuracy and economy in materials and labor in these difficult times. By accepting this task as their medium for a conservation of national resources, and as an opportunity for displaying their true virility and adaptability, they are contributing in no small measure to the establishment of the solid foundations upon which future prosperity can alone be built.

In the particular sphere of tire manufacture it is usual to find a special department devoted to the problem of reducing errors and waste. Its duty consists in recording, classifying, and examining the causes of productive inefficiency, studying methods of improvement, and recommending changes in program, whether it be but the changing of the color of a tag, to eliminate confusion between sizes or types, or altering the disposition of a whole department's equipment, to insure greater ease and convenience in handling materials.

Where the Causes Lie

Mistakes during manufacture, apart from those resulting from faulty specification, are traceable to 2 fundamental causes, one largely psychological, the other administerial. Within the first category are the errors attendant upon such mental conditions as inattention, carelessness, preoccupation, or the so-called "inherent predisposition," which can also connote physiological, as well as psychological, peculiarities resulting in mistakes; while deficiencies of routine, exemplified by lack of proper cooperation between departments, inefficient factory systems or layout, and inadequate or unimaginative scheduling of production, often account for the responsibility of managements in promoting inaccuracy of manufacture. These are largely the causes of scrap stock also, but a full understanding of the many additional factors influencing economy of materials, labor, power, etc., emerge from the ensuing account, which deals with the tire factory by departments.

Perhaps the most convenient manner in which to classify waste arising from tire manufacture is to consider the means of its ultimate disposal or utilization. Accordingly, 3 main subdivisions may be assumed.

In the first place is utilizable waste, or that which can be reprocessed directly or indirectly. In the former case it loses nothing of its worth, except that representing the expenditure of labor for its first processing; and in the second, it loses its value as a first grade material and becomes classed as "workaway" stock. Secondly is the type of waste which can only be successfully combated by suppression, since it can never be recovered once it has occurred. In this class are the intangible agencies of production: steam, air, water, power, and labor; and without constant vigilance these can promote a waste bill of alarming proportions, for, as waste, they assume an insidious character, by reason of their indeterminate and elusive nature. Lastly is that class of manufactured waste which cannot be suitably reemployed on the premises, and is sold for reclaiming, or, in extreme cases, is consigned to the incinerator.

It may possibly appear, superficially, at least, that the greater responsibility for losses through wastage and mistakes lies with those directly engaged in operating productive machinery; but although their liability may not easily be overestimated, it must be borne in mind that every factory operation, considered as a continuous process, is ultimately dependent for its efficiency upon effective administration, and that the smooth progression of raw materials and partly made-up goods through the factory is indispensable to a satisfactory control of waste and error. Without a factory operating as a corporate unit, each section proceeding in the common interests of the whole, these important items of expense can never be reduced to the workable minimum or even systematically identified and catalogued preliminarily.

Purchasing

Before the raw materials which are to go into the tire have even left the premises of their vendors, this cooperation begins to take effect. The purchasing department's work starts here, and without the closest understanding between this section and the sales department, *via* the factory, the proper functioning of the whole organization is impaired. While stocks must be kept at a minimum, to avoid unnecessarily encumbering storage space, sufficient materials must be on hand at all times to cope with sudden demands; and it is a matter calling for the constant exercise of ingenuity and judgment to maintain this nice balance, subject as it often is to the vagaries of suppliers, transport conditions, and market fluctuations.

The purchasing department stands or falls by its system, but whatever method is adopted, it should give the minimum of opportunity for waste. As a general rule a centralized system of purchasing has many advantages over a decentralized arrangement. Men experienced in buying for factory requirements find that central powers for bargaining, deciding terms, and placing contracts give indisputably greater satisfaction and room for economy than the alternative. Briefly, these advantages may be summarized under 6 heads.

1. Uniformity and continuity of policy. The conflict of ideas and methods probably accounts for more waste, delay, and error than is superficially apparent, no matter what sphere of human endeavor is involved, and the pursuance of a definite policy makes for closer understanding and cooperation between all concerned.

2. Concentration of effort. One person, or group of

persons, is, patently, infinitely more effective by entire application to one task, or the study of one type of job, than by having to regard a job as a sideline or as an irritating extra duty.

3. Economy in carrying stocks. Apart from the more obvious implications of this fact, there is also the insurance that the unforeseeable surpluses of one section can be transferred to another and utilized directly or by substitution.

4. Consistency in quality and adequacy of supply. These can only be insured by bulk purchasing and efficient centralized stock records, but have the extremely desirable result of promoting all-round confidence among the heads of producing units.

5. Advantageous placing of business. This point can be epitomized in 4 words: keen prices, preferential service.

6. Elimination of friction with suppliers. Only a person fully conversant with the laws of buying and selling can arrange business to provide against the many little details which lead to misunderstandings with suppliers.

The greatest room for economy frequently lies in maintenance costs, as the result of the temptation for over-ordering, or inability to forecast probable requirements. Of course adequate supplies of replacement parts are essential; otherwise production will suffer unnecessarily when breakdowns oblige the fitting of new parts, but it is usually in requisitioning the smaller implements and accessories that the exercise of careful judgment is most needed. For the numerous small items of equipment necessary to the various stages of manufacture: brushes, cans, knives, stitchers, scissors, and all manner of small tools, it may prove a good plan to price the foreman's requisition so that the users of these articles are brought to realize the costs involved when their carelessness or lack of consideration makes replacement necessary.

In purchasing raw materials the department has one indispensable ally: the laboratory. Despite the enormous advances and improvements for which the researches of the industry's chemists have been responsible, it is hardly an exaggeration to assert that it is in the field of quality control that the laboratory pays most dividends. Not only does this control of quality involve the maintenance of standards to which the supplier must adhere, but it incidentally provides the purchaser with a broader basis for negotiation, engendering a closer understanding between the 2 interdependent organizations, which has been of almost incalculable help in reducing waste both in the use and the manufacture of essential commodities.

The close examination of raw materials should not be restricted merely to raw rubber, reclaims, fillers, reenforcers, and other compounding ingredients, but should include every other constituent of the tire. Foremost among these are the fabrics employed in the carcass. A rigorous inspection, by one thoroughly conversant with the manufacture of tire fabrics, should be made of every roll of fabric before processing. Especially is this policy of value where wefted cord, as distinct from the creel form, is used, for faulty manufacture of the fabric will be evidenced by such conditions as "bag" and crowded and crushed cords at the calender. Excessive waste of cord is the certain result, and the supplier must be impressed with the absolute necessity of weaving under consistent tensions. It is also possible for a person conversant in this way with the difficulties of both user and manufacturer of fabric to suggest refinements in methods of manufacture or delivery which eliminate sources of waste and reduce the possibilities of error: for example, reduction of header waste, in the processing of wefted cord by an alteration in equipment permitting rolls of 500 yards to be used instead of 250 yards, thus halving this class of waste and reducing handling charges.

It may similarly be found that cooperation between the tire manufacturer and the producer of bead wire can be of the utmost advantage to both, not only as it concerns the specifications of the metal and the wire itself, but as convenience in coiling, wrapping, and preserving good condition.

Compounding

The use of code numbers and letters for identifying grades of rubber and compounding ingredients is practically universal throughout the rubber industry. The translation of consignments of such raw materials from their commercial or technical nomenclature to the factory's code should be the duty of a responsible person, for mistakes in this connection are of an importance that requires no digression. It is not unusual for labels to become lost, however, and identification thereby necessitated. Guesswork or the superficial judgment of factory hands, or even the foreman, must never be relied upon, and relabeling should be undertaken on the responsibility of a qualified person, such as the works' chemist.

Part of the laboratory routine consists in passing raw materials for use in production, and the system of issue from the stores should be such as to prevent the use of untested supplies. This examination of materials includes, of course, raw rubbers, and not only must the grade for which each consignment is suitable be decided by this department, but a close inspection of all rubber for use in inner tubes and extra-quality casings should be a regular procedure.

When a combination of unforeseen circumstances results in the exhaustion of the stocks of some material, it may sometimes be possible for the chemist to arrange for the substitution of a substance of proximate qualities, as an emergency measure. Very often such substitutions can only be allowed in certain specified mixings, and it becomes doubly important to impress upon everybody in the compounding section that no unauthorized changes of this nature can be countenanced. Foremen are sometimes tempted to regard a substitution under one particular set of circumstances as a precedent for all future occasions, and by acting on this assumption may either precipitate epidemics of poor quality conditions that are unaccountable to the chemist or involve unnecessary costs by using more expensive ingredients than have been provided for.

A further temptation of those engaged in the compound room is to put up batches from memory, without consulting the specification cards. Even though long practice may have made the weighing-out of pigments almost automatic, occasional lapses of memory are by no means impossible or unusual, but an equally important aspect of the question is that small changes in formulae, which have a great significance in large-scale production, may be overlooked. Examples of such changes are the addition of a small proportion of defective or refined stock for work-away purposes, the replacement of massed for raw rubber, and the altering of an antioxidant, softener, or dispersing agent—small items which do not make an alteration in code or identification number desirable, because of the unnecessary complication, and are therefore only apparent by a scrutiny of the work cards.

Compound Room Equipment

There are few tire factories of any significance nowadays which have not a sufficiently large output to warrant a more or less automatic system of weighing out pigments and rubber, checking them, and consigning them to the mill room. Proper planning of the layout of this section is essential if wastage of materials, labor, and time is to be minimized, and no effort should be spared in

making this department as well ordered and efficient as any in the whole factory.

After the broad principles of the system to be used have been established, mistakes are chiefly reducible by attention to detail and rigid adherence to the ordered sequence of operations decided upon. This sequence of operations is obvious enough, and the guiding principle for insuring expediency and smooth working within it must be the circulation of containers with the least possible of effort, of carrying materials by hand, and of changes in direction. Where output is on an extremely large scale, it may prove most convenient to group the storage bins around a fixed scale and duplicate the stocks of the materials used in very large quantities, e.g., sulphur, zinc oxide, carbon black, etc. It should be remembered, however, that practically every batch occasions the employment of not one scale, but several, each of the necessary degree of accuracy for the divergent quantities of the various ingredients in each batch. A number of considerations may thereby be introduced which discourage the adoption of the group arrangement and render more favorable the provision of mobile scales in conjunction with a straight-line storage formation. Accuracy and ease of supervision may be further assisted by the many small practicable precautions, such as reserving special vessels for liquid accelerators, and isolating the small quantities of ingredients like sulphur, solid accelerators, resin, stearic acid, etc., from the bulk pigments, by providing separate small pans for them.

As in every other stage of tire manufacture, the conveyer is finding extensive adoption in the compounding section, principally for transporting the weighed up batches to the mill room. To employ a conveyer for this purpose, however, will show no very real advantage over trucking unless an uninterrupted daily program of production is possible. Otherwise much is still to be said for grouping the pans of weighed pigments and rubber in batches on trucks.

The Mill Room

As in all other spheres of industrial activity, rapid progress in rubber manufacture has been accompanied by expensive waste and difficulty, particularly as a result of the introduction of fast organic accelerators. It is safe to say, however, that nowadays there is small excuse for the defective stock situation getting out of hand in the mill room.

Deviation from the technique developed for handling all classes of stocks in the process of mastication and mixing is responsible for scorched stock not only in the mill room, but in the subsequent stages of warming up, tubing, and calendering. Rubber as delivered by the mill room may appear of good quality to the calender or tuber operative, but when placed on the warm-up mill or worked in the hot rolls of the calender or in the tuber, it may begin to scorch.

A variety of mistakes may be responsible for such a contingency. In the first place the stock may have been batched in slabs of excessive thickness so that heat was retained which affected the stock in storage. To check this danger a watch can be kept on slab thickness by the laboratory (especially where each batch is sampled and tested by this department), and any large variants from specified practice traced so that suitable precautions may be taken. Secondly, sufficient time may not have been allowed for cooling the batch after mixing; or the mill cooling water may have been allowed to fall in volume, or rise in temperature for some other reason (a maximum of about 55° F. should be set for this water, and a continuous record kept of the temperature readings). Perhaps, however, the least excusable error responsible for burnt stock is for different stocks to become mixed in storage. It is by no means difficult for this mix up to occur, with such stocks as black sidewalls and treads, especially where a range of qualities is carried, and scorching usually results from the mixing of stocks having different accelerators which make a very rapid combination (e.g., D.O.T.G. and mercaptobenzothiazol). The further danger, too, exists of qualities becoming confused, the seriousness of which needs no stressing.

If burn-ups are frequent owing to either of the last 2 circumstances, it may prove profitable to consider the storage layout and the working conditions of the mixing department, with a view to devising such improvements as will make handling more expeditious and convenient, and adequate attention to each batch possible. A close analysis of the duties of truckers and helpers may also be useful, for it sometimes happens that change of schedule will permit existing labor to give the necessary extra attention to the cooling and storage of stocks.

In addition to the foregoing, the mill room can be responsible for a number of mistakes in the mixing process itself. Here a fine technique has been developed for every stock used in the factory: definite periods for "breaking down" the rubber, working in pigment, milling for thorough dispersion, and batching-off, and fixed times for adding softeners, sulphur, and accelerators. Stock troubles result when these rulings are ignored, as:

1. Caked pigment may be due to either cutting the rubber before the pigment has worked in properly or adding pigment before the rubber has become completely plastic on the mill rolls.
2. Poor dispersion usually results from one of the above causes or the abbreviation of the final milling (a minimum number of cuts in each direction is sometimes set for this part of the operation, as well as a time period).
3. Scorching, either on the mill or subsequently, may owe its origin, in addition to the mistakes already enumerated, to the premature addition of sulphur in stocks employing very rapid accelerators, or the insufficient cleaning out of mills after mixing accelerator master batches. To avoid the latter risk special mills should be reserved for master batches if possible, for the small amounts of accelerator from these batches which can lodge in inaccessible places are capable of ruining normal stocks.

There are also, of course, innumerable other mistakes capable of seriously affecting stock quality; probably the foremost of these is the omission of some essential ingredient. This, in common with similar errors, is usually watched for by the laboratory, however, in its stock testing routine. Upon this department will also devolve disposing of defective stock as efficiently and economically as possible, by recommending its use in suitable lower quality mixings. It is probably most desirable to incorporate such workaways with the formulae of the "host" stocks to insure that the recommendations of the chemist are consistently followed.

Hakuenka

Rubber goods of best quality are not always essential; hence the need and purpose of "fillers" to regulate the volume of products. The volume cost of ingredients determines their economic value; therefore the factor of specific gravity is very important in the rubber business, which in the final analysis is carried on by volume and not by weight. In respect to volume cost crude rubber at current price levels is the ingredient of lowest volume cost, but among mineral ingredients of specific utility in rubber mixings Hakuenka occupies a favorable position because of its low gravity and competitive pound cost.

EDITORIALS

The National Recovery Act

THE National Recovery Act became a law on June 16, and the rubber industry, through prompt action on the part of The Rubber Manufacturers Association, Inc., finds itself well advanced in the preparation of the codes to be proposed by the various divisions of the rubber industry.

The deputy administrators named by General Hugh S. Johnson, administrator of the National Recovery Act, will assist him in conducting the hearings in which the employers and workers will be heard on any proposed code.

The code for the various divisions of the rubber industry will fix minimum wages and maximum hours of work and prescribe regulations designed to eliminate unfair practices of every kind.

When the code has been approved by the rubber manufacturers, it will be submitted by the administrator to the President for approval; and when finally approved by him, it will be in the nature of the "law merchant" for the rubber industry. Newton D. Baker has been retained by The Rubber Manufacturers Association, Inc., as special counsel.

Why Discard Brains?

ONE of America's leading manufacturers has just expressed his conviction that industry is not entirely a young man's job. Experience and mature judgment have their place in the manufacture and the distribution of the nation's commodities, as well as youthful initiative, enterprise, and energy, this prominent executive believes.

With industry again coming into its own after a long period of restricted activity, timely interest attaches to the views of W. O'Neil, head of the General Tire & Rubber Co., Akron, O., on the subject of age and industry.

"In this fast-moving machine age there has developed a theory that men over 40 should be thrown into the discard but, in our organization, we have a number of men over 60 who are doing real jobs," Mr. O'Neil says. "While we do not make a practice of hiring old men, we certainly have no age limit on keeping them.

"Bricks and mortar don't make a plant—neither do chemistry and engineering—it takes men to make a plant. Men must feel safe in their jobs, sure of their jobs. If the only future they could look forward to was that, when they reached a certain age, they would be thrown into the discard, they could not do their best work. Men have to be proud of their work and happy in their work. We must recognize the capabilities and advantages of age and of experience."

Mr. O'Neil's views are interesting in view of the fact that statistics show that the average age of executives in his own organization is 11 years younger than that of any of 4 of his largest competitors.

As the French adage has it, "If youth but knew; if age were but able." Industry is neither a young man's job nor an old man's job. Both have their places and each needs the other.

Epochal Times

THESE are indeed very eventful days for the rubber industry of the United States. Crude rubber, the basic raw material, has been lifted from the depths by the inflation of our currency, which caused prices to rise from the year's low of 2-15/16¢ to 6-3/8¢ a pound, an advance of 117%. The May consumption of crude rubber was 44,580 long tons, the high record figure since May, 1929, when 49,233 long tons were consumed by the rubber industry.

Wage increases have been announced during May and June by the large rubber manufacturing companies, and many factories throughout the country are reporting increased orders, necessitating the employment of additional operatives and in many cases full time operating schedules.

Automobile production has been steadily advancing to meet the demand for new cars, and sales last month reached the highest point of the year. These facts explain the increase of production, wages, and prices that has been taking place in the tire manufacturing industry.

Now comes the new era of government control in which The Rubber Manufacturers' Association, Inc., will cooperate fully so that the rubber industry may quickly recover prosperity once more and also achieve greater stability.

THE INDUSTRIAL RECOVERY ACT PERMITS THE PRESERVATION of individual business units by giving them a chance to prove their own ability under fair competitive conditions. It provides the opportunity for the individual business unit to succeed on its degree of ability in management, says Henry I. Harriman, president of the Chamber of Commerce of the United States.

What the Rubber Chemists Are Doing

How Molded Hard Rubber Compares with Synthetic Resins

Coleman P. Morgan[1]

IT HAS been the general belief that synthetic resins have been fast replacing hard rubber, and to a certain extent in the past this has been true. Old methods and long vulcanizing periods necessary to produce a finished article were the factors hampering hard rubber. Now with the aid of modern accelerators, control of compounding practice, and the employing of better and faster methods of processing, hard rubber today is holding its own and will not only regain some of its former uses, but enter into fields not touched before by this desirable plastic.

Where hard rubber has been slow in keeping in step with synthetic resins is in molding, not in quality. Formerly press molding was a very slow process, when used to semi-cure or full cure in the mold. With the advent of organic accelerators and with the knowledge of how to use them, many of the accelerators designed to meet the needs of the soft rubber technologist have been successfully adapted in shortening the vulcanization period of hard rubber at much lower temperatures. Of these the aldehyde-amines, di-substituted guanidines, tetramethylthiuram disulphide in conjunction with mercaptobenzothiazole, and tetramethylthiuram-monosulphide, give very excellent results in producing curing ranges from very slow to extremely rapid rates of cure.

With the aid of these accelerators and a semi-cure method of vulcanization, hard rubber can be molded at a rate quite comparable to that of synthetic resins, at a much lower mold cost per unit employing cast metal molds in place of steel. To illustrate, for an article of nominal thickness (¼- to ⅝-inch), synthetic resins molded in a 50-impression hardened steel mold on a 3-minute cycle would produce 1,000 pieces per hour; whereas the same production is obtained from 20, 10-impression cast metal molds, cast from a master die, on a 12-minute cycle for hard rubber and at a much lower mold cost per unit including the 3 to 4 hours required to complete the vulcanization of the rubber. This is done in large double shell vulcanizers.

[1] Chemist with The Vulcanized Rubber Co., 261 Fifth Ave., New York, N. Y.

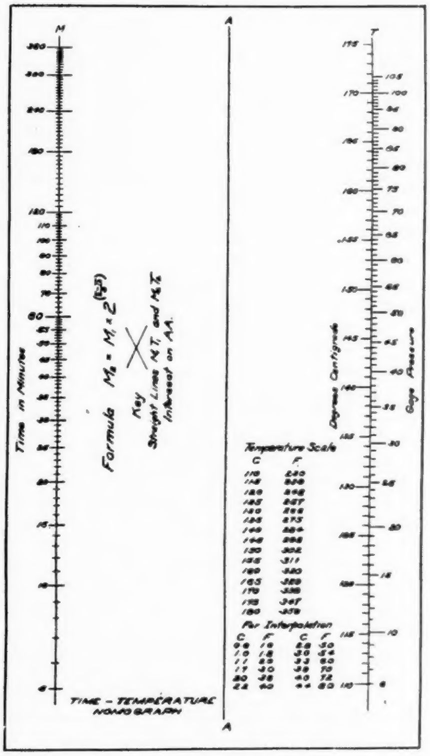


Fig. 1. Time and Temperature Nomograph

Hard rubber, like all other types of material that require heat to accomplish the cured or hardened state, varies in its rate of vulcanization in proportion to the thickness. In the semi-cure method the cycle is approximately 5 to 8 minutes for thin articles, up to 25 to 30 minutes for thick pieces. With the use of the more rapid type of accelerators, previously mentioned, hard rubber one inch thick can be completely cured in 15 to 18 minutes, with proportionately less time for thinner articles.

Time and temperature in the curing of hard rubber can be varied quite considerably to meet nearly all conditions of manufacture and still obtain the same degree of vulcanization. The nomograph in Figure 1 provides a quick means of computing any changes in time or temperature that may be required, reproducing quite accurately any known curing condition.

Some comparison of molding times have been mentioned for hard rubber with variations, that hold for the resins as well. A comparison of physical, chemical, and electrical characteristics of the 2 types of materials will show advantages inherent in both, yet clearly indicating that the properties of the greatest importance to industry favor, to a large extent, hard rubber. The following table lists these properties; some of the data are obtained from the various journals and handbooks.

	Hard Rubber	Phenol-Form. Resin
Specific gravity	1.15-1.25	1.30-1.50
Tensile strength (lbs. per sq. in.)	3,000-8,500	2,000-7,000
% Elongation	1.5-3.5	1.0-2.0
Compressive strength (lbs. per sq. in.)	9,000-12,000	24,000-30,000
Water absorption (24 hours)	0.019%	Up to 0.3%
Resistance to chemicals		
Sulphuric acid, up to 50° Be.	Unaffected	Attacked
Nitric acid, up to 16° Be.	Unaffected	Attacked
Hydrochloric acid, conc.	Unaffected	Unaffected
Hydrofluoric acid.	Unaffected	Unaffected
Weak acids	Unaffected	Unaffected
*Organic materials, general	Unaffected	Unaffected
Mineral oils	Unaffected, unless specifically compounded	Unaffected
Vegetable oils	Unaffected	Unaffected
Alkalies	Unaffected	Attacked, unless specifically compounded
Dielectric strength (volts per mil.)	1,200	600

*A complete tabulation of the resistance of hard rubber to inorganic and organic materials may be found in *Chem. & Met. Eng.*, Dec., 1932.

It can readily be conceived that the chemical inertness of hard rubber lends itself to many applications in the process industries that cannot be fully enjoyed by the phenolic plastics and, consequently, will not be readily displaced by them. As the properties of hard rubber are further improved to withstand certain inherent faults, mainly the effect of extreme temperatures on the structure of the rubber, many other advantages will then be open to this material.

Colored hard rubber in the past has been limited to brown, various shades of dull orange and red, produced by inorganic pigments such as the antimony and mercury sulphides. Organic colors, until recently, fared badly in producing brighter colors in hard rubber, owing to the length of time and

the high temperatures required for vulcanization and the presence of such large quantities of sulphur necessary in its manufacture. Through improved compounding practice and careful regulation of time and temperature, some very striking and vivid colors have been produced from organic colors ranging from blue to red, with many variations in shades of each color. It is not to be inferred that pastel shades have been produced, although some colors do approach this stage. It is hoped that further investigation will find a way to make these colors more stable under the conditions to which they are subjected in order that the more delicate and desirable shades may be produced. A complete outline of experiments on hard rubber colors carried out in our laboratory may be found in a recent report[2].

These colors are the result of a number of years of experimental work in which it was found that zinc oxide plays quite an important part in obtaining the various shades desired.

With increasing efficiency and methods of manufacture, lower production costs, and improved compounding practice, hard rubber will keep in step with the advance of plastic materials and remain desirable and competitive.

[2] Laboratory Report No. 163, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., on "Hard Rubber Compounding," under "Zinc Oxide in Colored Hard Rubber."

Akron Group Outing

The annual outing of the Akron Group, Rubber Division, American Chemical Society, took place at the Fairlawn Golf Club, June 19. Free beer shared with golf the interest of the large attendance of the rubber men and their guests. Golf matches occupied the time from 2 o'clock until dusk.

Impact Molding Material

A new product has been developed by Bakelite Corp. that offers many interesting possibilities, particularly in the mechanical field. It is called Impact Molding Material because of its superior mechanical characteristics. It is a tough substance with several times the shock resistance of ordinary molding material, the kind that is used for bottle tops, switch plates, pencils, etc.

IVCO Lacquer

IVCO lacquer is a material developed as a surface coating for rubber articles. It is available in clear, black, white, red, blue, and various other colors. Articles on which it is being used most successfully are golf balls, play balls, various druggists' sundries, molded products, hard rubber tubes, sheets, steering wheels, motor mounts, and other rubber parts used in the automobile industry.

Vulcanization of Chloroprene Plastics[1]

E. R. Bridgwater and E. H. Krismann[2]

THE preparation of chloroprene plastic polymers and their vulcanization to produce elastic rubber-like products have already been described[3]. The purpose of this paper is to show the effect of various compounding ingredients, alone and in combination with one another, on the rate of vulcanization of chloroprene plastic polymers and their effect on the physical properties of the vulcanizates.

All tests reported herein were made on a modified chloroprene plastic polymer (known commercially as DuPrene Type F), containing 94.5% of polymerized chloroprene, 5% of a mineral oil known commercially as medium process oil, and 0.5% of phenyl-B-naphthylamine.

Summary

Tests have clearly shown the desirability of compounding this polymer with zinc oxide, magnesia, and rosin, and have demonstrated that these 3 ingredients, when used together, have a desirable effect that cannot be obtained with, or even predicted from the results obtained with any one of them alone or the combination of any 2 of them. It has been shown further that, although it is possible to obtain good vulcanized products from this polymer without the addition of sulphur, a great increase in the rate of cure and substantial improvement in physical properties of vulcanized products result from the use of as little as 0.5% of sulphur on the weight of the polymer. It is further shown that pine tar and rosin oil may be substituted for rosin, but that they are somewhat less efficacious. The authors postulate that the value of rosin, pine tar, and rosin oil is probably due to the organic acids that they contain. Coumarone resin and brown factice are shown to be desirable compounding ingredients for chloroprene polymers.

[1] "Factors Affecting Rate of Vulcanization of Chloroprene Plastic Polymers." *Ind. Eng. Chem.*, Mar., 1933, pp. 280-83. Presented before the Division of Rubber Chemistry at the 84th Meeting of the American Chemical Society, Denver, Colo., Aug. 22 to 26, 1932.

[2] E. I. du Pont de Nemours & Co., Wilmington, Del.

[3] Nieuwland, Calcott, Downing, and Carter, *J. Am. Chem. Soc.*, 53, 4197 (1931).

Cellular Rubber Bicycle Tires

A CELLULAR rubber that yields good results as resilient material in place of air inflation for bicycle tires is manufactured in Oslo, Sweden, under the patent of Alf Mathiesen, a Norwegian. This material has been service tested 4 years at pressures up to 175 kilograms per square centimeter of tire section without deterioration of the material. The tires require no pumping up, do not deflate when punctured, and support about the same weight as ordinary pneumatic tires.

Rubber Bibliography

NATURE OF ACTION OF ORGANIC ACCELERATORS FOR VULCANIZATION. II. Special Properties of Organic Accelerators. III. Action of Ostromislenski's Vulcanizing Agents on Rubber Sols. IV. Detection and Analysis of Organic Accelerators. 1. Systematic Identification of Organic Accelerators. K. Shimada, *J. Soc. Chem. Ind. (Japan)*, 1933, 36, 52-58B, 82-85B (1933).

DEODORIZATION OF VULCANIZED RUBBER. H. P. Stevens, *Bull. Rubber Growers' Assoc.*, My, 1933, pp. 261-65.

MANUFACTURE OF SPONGE RUBBER. (Vulcanization.) H. Lindemann, *Kautschuk*, May, 1933, pp. 66-70.

KNOWLEDGE OF RUBBER ANTIOXIDANTS. III. Behavior of Natural and Artificial Antiagers to Sun and Ultra-Violet Light. (Preliminary Communication.) F. Kirchhof, *Kautschuk*, May, 1933, pp. 70-72.

OIL RESISTANT RUBBER. E. Karsten, *Kautschuk*, May, 1933, pp. 73-74.

REVIEW OF THE DEVELOPMENT AND PROGRESS OF THE CHEMISTRY AND TECHNOLOGY OF LATEX AND RUBBER FROM 1927 TO JULY, 1932. Dr. St. Reiner, *Caoutchouc & gutta-percha*, May 15, 1933, pp. 16395-97. (To be continued.)

CHLORINATED RUBBER. *Caoutchouc & gutta-percha*, May 15, 1933, pp. 16402-403.

DISEASES OF RUBBER IN CEYLON, 1932. R. K. S. Murray, *Trop. Agr. (Ceylon)*, Apr., 1933, pp. 214-17.

GERMAN TIRE INDUSTRY, 1925-1931. *Gummi-Ztg.*, May 12, 1933, pp. 834-35.

PRACTICAL HINTS FOR MANUFACTURING. Common Errors and How to Avoid Them. E. Wurm, *Gummi-Ztg.*, May 19, 1933, pp. 861-63.

GUTTA PERCHA: ITS CHARACTERISTICS AND MANUFACTURE. A. E. Penfold, *India Rubber J.*, June 10, 1933.

Hydroresin

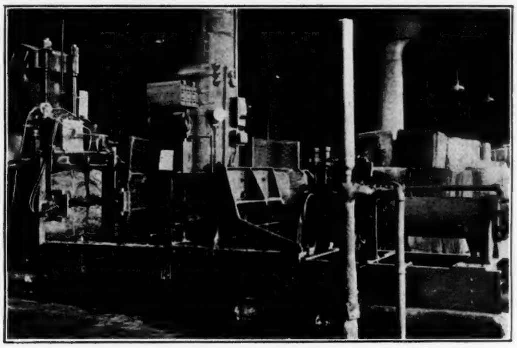
Hydroresin is a non-drying, sticky orange transparent resin that absorbs 70% water without losing viscosity or clarity. Larger amounts of water produce milky emulsions which can be cleaned up with alkalies. This resin is used to increase the adhesiveness of latex films. It dissolves in alcohol, toluol, naphtha, turpentine, and other hydrocarbons and blends with pyroxylin, resins, shellac, latex, waxes, casein, glue, gelatine, and starch.

Hydrowax

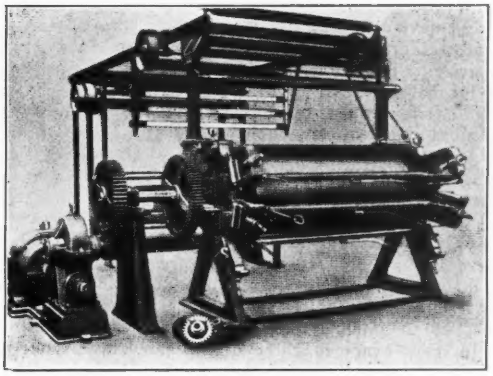
Rubber products are now being coated with a special water wax emulsion called Hydrowax. When this is applied properly the following advantages accrue: a glossy, shiny surface results; sun-cracking is diminished; sticking of sheet goods is reduced; soiling because of handling and surface decomposition is curtailed; and the surface pores are sealed.

Its use is also indicated on leather, artificial leather, and cement or composition products of a porous nature.

New Machines and Appliances



Bale Cutter with Electrically Heated Knives



3-Color Printing Machine

Crude Rubber Cutter

THE cutter pictured in the illustration quarters a bale of crude rubber by electrically heated blades. The machine consists of a horizontal ram which is hydraulically activated and 2 stationary electrically heated blades. The blades are placed to form a cross so that when a bale is pushed through them by the ram, it is cut into 4 pieces. The cutting is facilitated by the use of heated knives, which greatly accelerate the cutting operation.

The temperature of the blades, when not cutting, is 250° F. The moment the bale contacts with them the temperature is increased to a very large extent. The blades would become cherry red with heat if they were not cutting through the baled rubber. When the rubber travels through the knives, it absorbs a certain amount of heat, giving in this manner just the desired cutting temperature. United States Tire Co., Inc., Detroit, Mich.

Rubber Printing Machine

THE improved type of 3-color printing machine here illustrated has been specially designed for printing on rubber goods. The machine embodies strong side frames having machined slides into which are fitted slide blocks with screw adjustment, to or from the center of the machine. They can also be adjusted laterally or vertically to set the print rolls. The center drum or impression cylinder is carried in slide blocks and its position can be regulated by the top screws and can be locked in a correct position.

The print rollers are of special steel on which the pattern to be printed is engraved; copper shells are eliminated, thus obviating the cost of a screw press and waste of time in changing. All the color "sets" or "nips" are on the front of the machine only. This design has distinct advantages, as it is seldom that more than 2- to 3-color work is called for, and further, the operator does not need to go under the machine to set color doctors. Color boxes are unnecessary, the doctors acting as "ducts" for the color, thereby also doing away with furnisher rollers. Lint doctors are found in practice to be also unnecessary for this class of trade. Bradbury, Saunders, Ltd., Radcliffe, near Manchester, England.

Variable Speed Power Unit

THE illustration pictures a variable speed power unit described as a ball thrust bearing, in which, however, the balls are in the form of fixed rollers, and the ball races are flat circular disks. This speed variator is built in sizes for delivering 2 to 20 h.p. The disk and roller traction principle used provides for a speed range of 3 to 1 with an infinite number of speeds between these limits.

Stanley Speed Variator

The rollers are in 3 pairs, which are arranged radially in a plane perpendicular to the shaft. They are positively driven from the motor, located in the upper part of the unit. The 3 pairs are held between 2 disks secured to the output shaft. The rotation of the rollers through their adhesive contact with the disks imparts rotary motion to the disks.

When the rollers are in their outermost radial position, the disks are given their slowest speed; and when the rollers are moved into the innermost position, the disks are revolved the most rapidly. Merritt Engineering & Sales Co., Inc., Lockport, N. Y.

Hard Rubber Polish

A FINISHING compound or polish has been perfected which gives to hard rubber surfaces a luster of unsurpassed brilliancy. The manufacturer of this material has exercised great care in selecting and blending its various ingredients. This composition is used sparingly, preferably on a flannel buff at a speed of 2,000 to 2,500 r.p.m. Care is taken not to crowd the work of polishing.

In connection with the polishing composition the same manufacturer offers an abrasive compound for use in preparing hard rubber surfaces for the final finish. This composition is applied to a firm muslin buff and is speeded to 2,000 to 2,500 r.p.m. It should be well applied to the buff in starting and sparingly thereafter to give a uniform cut and prepare the surface for the finishing wheel. The Nulite Polish Co., Inc., 240-242 Plymouth St., Brooklyn, N. Y.

Hydro-Power Press Pump

THE new radial pump here illustrated is particularly suited to generate pressure for operating hydraulic powered machinery.

Many years of experience in the constant study and application of high pressure pumps to hydraulic equipment have been drawn upon by the manufacturer in planning for the design and development of these pumps. The advantages they possess may be summarized thus: high efficiencies, both mechanical and hydraulic; remarkable smoothness of delivery; vibrationless operation; positive displacement throughout suction and delivery; simple design with a minimum of parts; rugged, harmonized proportions, complete automatic lubrication; and low maintenance.

These heavy duty radial pumps are built in 6 sizes, ranging from 1 to 100 gallons per minute, with pressure capacities up to 3,000 pounds per square inch, to meet every machine drive requirement. All features of the design are covered by patents or pending applications. The Hydraulic Press Mfg. Co., Mt. Gilead, O.

Rotary Displacement Pump

THE new type of rotary displacement pump illustrated embodies a number of radically new features, particularly the ability to run at speeds heretofore considered impracticable for displacement pumps. Power is applied to a central or power rotor, which meshes with one or more sealing rotors of such form that they are propelled largely by fluid pressure, with a minimum of mechanical contact. This action results from the ingenious shape of the threads; those of the power rotor are convex; while those of the idler rotor are concave. This tooth form, which is patented, accomplishes sealing so effectively that numerous turns of the thread around the rotor, as found in common screw pumps, are not required to keep slippage to a small value. Efficiencies of 80% to 90% have been obtained on independent impartial tests.

The velocity of the liquid through the pump is low, and there is no trapping or cutting off of liquid in tooth pockets, as in most rotary displacement pumps. Because of this, and the fact that there is nothing in the mechanical construction to limit the operating speed, the pump operates successfully and quietly at the higher motor speeds and even at turbine speeds.

These pumps are available for oil service in capacities ranging from ½ gallon to 700 gallons a minute and for pressures up to 500 pounds per square inch. De Laval Steam Turbine Co., Trenton, N. J.

Gump Vibrox Packer

Bag and Barrel Packers

VIBRATORY bag and barrel packers are as desirable for packaging compounding powders for delivery to rubber plants as for packaging in flour, feed, and cereal mills, for which lines the type shown was designed.

This machine is made in 3 sizes. The smallest will pack bags weighing 5 to 15 pounds; the intermediate size, 25 to 75 pounds; and the regular size for barrels or containers weighing 100 to 400 pounds. An extra heavy pattern is also made for barrels of 450 to 600 pounds.

The machine may be had either for belt or direct connected drive. It is operated by a small amount of power and is free from the trouble experienced with old-type packers owing to the absence of clutches, levers, etc. It operates continuously, and the operator need only place the empty container and remove it when filled. The action is such that the machine packs the container while it is being filled.

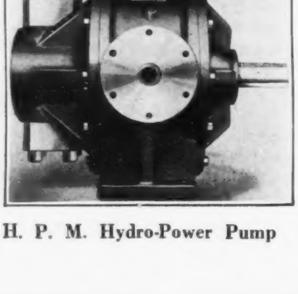
These packers are used extensively for packing dry chemicals and any powdered material that will compact of its own weight. B. F. Gump Co., 431-437 Clinton St., Chicago, Ill.

Magnifier Stand

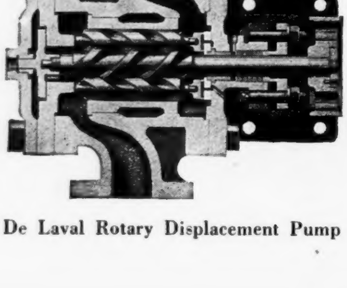
THE focusable magnifier stand is decidedly convenient to the rubber technician for low-power examination of textiles, compounding ingredient powders, etc. It leaves both hands free for manipulating or dissecting the sample, thus obviating the annoyance of endeavoring to hold the glass steady and in focus by hand, and thus speeding the work of examination.

The combined base and pillar is cast of heavy metal providing a stable, rigid support. At the top of the pillar is a knurled thumbscrew with which the focusing adjustment is made. This adjustment raises or lowers the parallel arm so that the magnifier is always kept horizontal and parallel to the specimen. The magnification is 3.25 times.

The spring clip, which holds the magnifier, is attached to the parallel arm by a swivel joint which allows the magnifier to be swung through an arc sufficient to permit examination of the entire petri dish without moving it. The knurled button seen at the end of the spring clip permits tilting the magnifier when desired. Bausch & Lomb Optical Co., Rochester, N. Y.



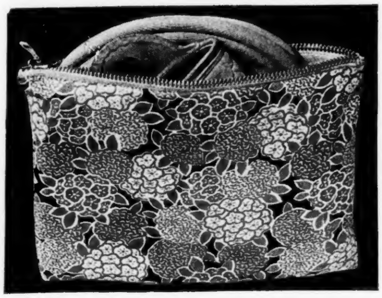
H. P. M. Hydro-Power Pump



De Laval Rotary Displacement Pump

Stone Focusable Magnifier Stand

New Goods and Specialties



Travelfold

Folding Douche for Travel

TRAVELERS who would take a douche bag or a fountain syringe with them on their journey now may satisfy that desire. For the Davol Rubber Co., Providence, R. I., cognizant of the demands of a traveling public, has created a compact douche of full 2-quart capacity that may be folded to take up very little space in a trunk or overnight bag. This Travelfold, as it is called, consists of a douche bag with regulation length tubing and shut-off, 2 hard rubber slip pipes, and an attractive, convenient, waterproof, envelope-style bag with a slide fastener. It has no metal hanger; so there is nothing to rust or break. This druggists' sundry comes in red and blue. Optional packing includes the Vagex irrigator pipe.

Acid Resisting Coupling

THIS hose coupling was developed primarily for vinegar hose. Its application, however, is not limited to any one specific acid condition, but can be used effectively wherever hose is used to conduct liquids with acid content.

Where vinegar hose is supplied with the standard type of long shank brass coupling, and clamps, it is not uncommon for the vinegar plant to have to replace these couplings anywhere from 3 to 5 times during the life of the hose. A replacement not only involves the expense of the new coupling parts, but also serious delays and disruption of the plant equipment. In many instances the hose is buried, and much liquid may be lost before the leaky or acid eaten coupling is discovered.

The new coupling is constructed of an alloy metal of high nickel content, and other ingredients specially developed to combat the inroads of acid upon the metal. This coupling is said to give uninterrupted service for the entire life of the hose, with a liberal margin of safety.

Another favorable feature of the coupling is that no washers are required. A ground joint union is used that eliminates the necessity of a gasket and supplies a positively leakless connection. Algonquin Co., 33rd and Arch St., Philadelphia, Pa.

New Cements

MANY improved cements have been developed recently to meet a wide variety of needs. Brief descriptions of some more popular ones follow.

Filling a demand, particularly in dry climates, for a bicycle rim cement that will remain plastic and not become brittle and hard, comes Dutch Brand Tire-Tite, which it is claimed will not dry out. A tire stuck on a rim with this cement can be completely removed and replaced on the rim without using additional cement. Tire-Tite, it is said, can be depended upon to stick tightly whether the tire is fully inflated or entirely deflated. This product is marketed in Van Cleef's new non-slip bottle (holding 2 ounces) with the swab welded to the metal cap, and in ¼-pint, 1 quart, and 1 gallon cans.

The year-around use of automobiles by motorists subjects the top to considerable weathering and changes in temperature. The natural tendency of the top material is to crack and shrink, pulling away from the drip molding, leaving a wide crack between the top and the drip molding which does much damage in wet weather. For sealing this crack quickly, neatly, and efficiently and for general top repair, Dutch Brand Drip-Seal, a top and drip molding cement was created. The nozzle-pointed tube in which it comes makes using the cement most simple. This product is supplied in either clear or black compound, the clear for sport tops or light colored decking. The cement is available in small, medium, and large tubes.

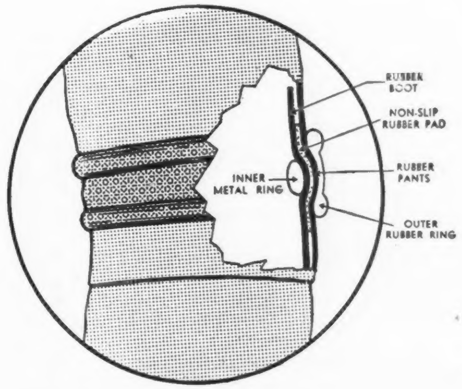
Ever-Tite Cement was developed especially for those demanding a cement of great adhesive powers. Ever-Tite is ideal for auto body trimmers and just as good for general use. It is reported to be unbeatable for sticking the lightest as well as the heaviest fabrics, such as canvas, imitation leather, rubber, cork, paper, and cloth to hard surfaces or to themselves. It will also stick glass to glass, metal to metal, wood to wood, or any 2 materials of like nature or combinations. Ever-Tite is not only waterproof, but its adhesive qualities are not affected by oil, steam, or heat. An air-drying cement, it always remains in semi-plastic state; consequently it will not chip or crack. It is offered in 2-ounce bottles, ¼-, ½-, and 1 pint, 1 quart, and 1 gallon cans.

Trim shops are busy these days, and running board repair work is an important item; for with the possible exception of floor mats, running boards are subjected to the most wear. For this specific work was made Dutch Brand running-board cement. It is excellent for attaching rubber matting to wood or metal running boards of autos. It sticks tightly, permitting the smooth laying of linoleum or rubber matting without bulging. Besides it is quick drying and waterproof. It comes in 1 pint, 1 quart, and 1 gallon cans. Van Cleef Bros., Woodlawn Ave., 77th to 78th Sts., Chicago, Ill.

Ingenious Waders

A CLEVER and economical device for combining rubber boots and trousers has been perfected by the Ideal Mfg. Co., Inc., 977 State St., Bridgeport, Conn., to give fishermen lightweight, waterproof waders at very low cost. When the angler or hunter feels the water will be too high for his regular rubber boots, he dons a pair of shoulder high, lightweight, waterproof pants boasting drawstring and suspenders, a reenforced seat, and a special arrangement for attaching the pants just below the knee to his boots. He then inserts a ring inside the boot, bringing the trouser leg over this ring and slipping the tension ring over the trouser leg to form a perfectly tight joint and a most serviceable pair of waders.

Drip-Seal Cement



Device to Join Boots and Trousers

Rubber Industry in America

OHIO

Goodrich Notes

President J. D. Tew, of The B. F. Goodrich Co., Akron, arrived in Boston, Mass., June 10, following a brief business trip in Europe. T. B. Tomkinson, Goodrich comptroller, met him in Boston.

T. G. Graham, Goodrich vice president, last month returned to Akron from a business trip in Mexico City, Mexico, where he inspected the Euzkadi factory, which recently began manufacturing tires and tubes under Goodrich license. Mr. Graham was accompanied by J. C. Herbert, assistant secretary.

R. F. Snyder has been transferred from the Goodrich Public Relations Department to the sales promotion division and placed in charge of publications, according to P. C. Handerson, director of advertising and publicity.

H. A. Marquand, professor of industrial relations at the University of Wales, Cardiff, visited Goodrich last month, while on a year's tour of American industries, studying large and small companies.

The B. F. Goodrich play day, annually one of the largest industrial picnics in the United States, will be held August 14, announced A. C. Sprague, general chairman.

Tires Again Higher

For the second time in about 5 weeks rising prices of the raw materials, cotton and rubber, lead to increased prices of tires, ranging from 4 to 20%, announced by the following: Dayton Rubber Mfg. Co., Dayton, O.; Firestone Tire & Rubber Co., General Tire & Rubber Co., B. F. Goodrich Co., Goodyear Tire & Rubber Co., and India Tire & Rubber Co., all of Akron, O.; Kelly-Springfield Tire Co., 1775 Broadway, New York, N. Y.; Lee Rubber & Tire Corp., Conshohocken, Pa.; Murray Rubber Co., Trenton, N. J.; Mohawk Rubber Co., Akron; Pennsylvania Rubber Co., Jeannette, Pa.; Pharis Tire & Rubber Co., Newark, O.; Sears, Roebuck & Co., Chicago, Ill.; Seiberling Rubber Co., Akron; Standard Oil Co., distributing through its gas stations Atlas Supply Co. tires; and United States Rubber Co., 1790 Broadway, New York. Many of these companies also raised the price of inner tubes from 10 to 15%.

The Goodyear Tire & Rubber Co., Akron, will hold its annual picnic at Euclid Beach Park on July 14.

Improving Business

Further reports throughout the nation indicate that business conditions, including those for the rubber industry, continue to grow better. Wage increases affecting at least 52,000 workers have been announced by the following: Falls Rubber Co., Cuyahoga Falls, O., 2 increases for factory employes only; Firestone Tire & Rubber Co., Akron, 10%, to all employes in the Akron and Los Angeles, Calif., factories, the cotton mills, battery and steel divisions, the footwear company, and the service stations; Fisk Mills, New Bedford, Mass., 10%; General Tire & Rubber Co., Akron, 10%, to Akron plant workers and branch representatives throughout the country; B. F. Goodrich Co., 10%, entire organization including cotton mills and service stations; Goodyear Tire & Rubber Co., 10%, to employes in factories in Akron, Los Angeles, and Gadsden, Ala., and all operating and distributing personnel throughout the United States; Lambertville Rubber Co., Lambertville, N. J., 5%; Mohawk Rubber Co., Akron, 10%; and Seiberling Rubber Co., Akron, 5%.

The Republic Rubber Co., Youngstown, through Vice President O. S. Dollison has announced that R. M. Gattshall, former advertising manager, has returned to the company as manager of distributer sales after a leave of absence of nearly 2 years during which time he served as executive manager of the Joint Merchandising Committee.

The Firestone Tire & Rubber Co., Akron, held its annual picnic June 10 at Meyers Lake, Canton. About 12,000 employes and their families, from Plant No. 2 and the mechanical building, attended. On June 24 workers of Plant No. 1, Xylos and steel products divisions, and members of the general office staff had their annual outing at the same place.

R. R. Olin Laboratories, Akron, reported that inflation of rubber articles with nitrogen gas previous to vulcanization is obtained by the use of ammonium chloride and sodium nitrate.

The Fremont Rubber Products Co., Fremont, manufactures stair treads, mats, juvenile accessories, as bicycle and velocipede handle bar grips, scooter mats, and molded parts, and special molded pieces. Stanley Surdyk is president and purchasing agent; C. W. Kirsch, vice president and treasurer; and A. J. Fischer, secretary.

MIDWEST

Waste Material Dealers Convention

The Twentieth Annual Convention of the National Association of Waste Material Dealers, Inc., Times Bldg., New York, N. Y., and embracing many divisions and affiliated associations will be held at the Hotel Sherman, Chicago, Ill., August 7, 8 and 9. The program originally scheduled in March will be carried out at the August meeting. In addition there will be the big problem of ways and means of fully cooperating with the Government in applying and carrying out in the waste material industry the provisions of the National Industrial Recovery Act.

The National Sporting Goods Distributers' Association will hold a Sporting Goods Show at the Hotel Sherman, Chicago, Ill., January 29, 30 and 31, 1934, in connection with the annual convention of the association. Only manufacturers who are associate members will be invited to display their goods. John Hatton, 7537 Brooklyn Ave., Kansas City, Mo., is secretary-treasurer of the association.

Van Cleef Bros., manufacturer of Dutch Brand rubber and chemical products, Chicago, Ill., recently established a warehouse stock with Mulligan-Midtown Warehouse Co., Inc., 601 W. 26th St., New York, N. Y.

Henry Ford has given Lincoln Memorial University 200 acres of farm land, value $40,000, part of which, at his suggestion, will be used to grow goldenrod in furtherance of Thomas Edison's experiments to develop rubber from the plant.

Charles E. Miller Corp. has succeeded the Chas. E. Miller Anderson Rubber Works, Anderson, Ind., manufacturer of vulcanizing equipment and Miller's rotary cookers and portable steam grease cleaner.

Rubberized Fabrics, Inc., 16th and Iron Sts., North Kansas City, Mo., recently incorporated, manufactures Lotuscloth rubberized fabrics for hospital sheeting, raincoat material, baby goods, etc. The process, dipping a silk base fabric into latex, was developed by W. J. Dean, president of the Dean Rubber Mfg. Co., and of the Dean & Kassebaum Drug Sundries Co., both of North Kansas City, who is in charge of the production of Rubberized Fabrics, Inc., and also a director. Other executives of the company are L. A. Pettit, Jr., president; Fred R. Merlen, vice president; Glenn A. Thomas, secretary; and Charles N. Taylor, treasurer.

EASTERN AND SOUTHERN

Commodity Exchange, Inc.

The Commodity Exchange, Inc., 81 Broad St., New York, N. Y., offers exceptional service to rubber producers, dealers, and manufacturers, for trading in futures on the consolidated exchange. Among the advantages offered are: increased value for hedging operations; broader market through concentrated trading on one floor; enhanced liquidity and greater financing facilities; concentration of buyers and sellers from all over the world in one market place; and enlarged and better services for those trading in several commodities. Walter Dutton is secretary of the exchange.

Monsanto Chemical Works, St. Louis, Mo., through President Edgar M. Queeny, reports that the Nitro, W. Va., plant of its subsidiary, The Rubber Service Laboratories Co., Akron, O., manufacturing chemicals for the rubber industry, is operating at the highest capacity since 1928 and that orders for some of the new products were requiring installations for increased capacity.

Pfaltz & Bauer, Inc., 300 Pearl St., New York, N. Y., through D. A. Korman announces that it has been appointed exclusive agent for C. Reichert Optical Works, Vienna, Austria, with a line that includes biological, medical, petrographical, and metallurgical microscopes and accessories and projection photographic testing measuring instruments for industrial and research work. Pfaltz & Bauer's new items are a micro-metallograph, the Romeis photo micrographic apparatus, and the fluorescence microscope.

The Austro-Daimler automotive plant, Vienna, Austria, recently shipped to the United States at the direction of E. K. Howe & Sons, Inc., 500 Fifth Ave., New York, N. Y., one of its pneumatic-tired railroad cars, which on June 12 had a trial run on the tracks of the Long Island Railroad from Jamaica to Babylon. Oskar Hacker, chief engineer of Austro-Daimler, inventor of the car, drove it. (The wheels of this car were illustrated and described in our March 1, 1933, issue, page 40.)

Hermann Weber, dealer in rubber, gutta percha, hard rubber, balata, and crepe soling, and distributer for hard rubber dust manufactured by James Ferguson & Sons, Ltd., London, England, on May 1 moved his offices from 43 Jackson St., Hoboken, N. J., to 67 Broad St., New York, N. Y. Telephone: Whitehall 4-5938-5939.

United States Rubber Co., 1790 Broadway, New York, N. Y., according to Secretary Eric Burkman, at a recent meeting of its directorate elected Lewis L. Strauss a member of the finance committee.

Herbert E. Smith

Well-Known Executive

Herbert E. Smith, prominent official of the United States Rubber Co., 1790 Broadway, New York, N. Y., reversed the Greeley edict in his quest for fame and fortune. For he was born in San Jose, Calif., on August 16, 1889, and was educated in the local grammar school, Washburn Prep School, and the University of California, from which he was graduated with the Class of 1911.

But in 1915 Mr. Smith joined U. S. Rubber as a salesman, and his rapid advancement soon brought him East. He became department manager, branch manager, and then manager of consolidations. In 1924 he was made general manager of a subsidiary company, United States Rubber Export Co., Ltd. The next year he was appointed the parent company's general sales manager and in 1926 second vice president in charge of all sales except tires. Later he was elected president of the U. S. Rubber Export Co. Subsequent promotions saw him U. S. Rubber vice president in charge of sales, a director, and a member of the executive committees of the head organization and its subsidiaries. At present Mr. Smith is vice president and a member of the executive committee, U. S. Rubber; president, U. S. Rubber Export Co., Ltd.; and a director, Dominion Rubber Co., Ltd., Montreal, P. Q., Canada.

This enterprising executive also is a member of the International Chamber of Commerce, National Foreign Trade League, Sigma Alpha Epsilon, Lotus Club, and New York Athletic Club, and is a director, too, of the Rubber Manufacturers Association, Inc.

E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., has appointed E. A. Rykenboer general manager of the R. & H. chemicals department to succeed C. K. Davis, recently elected president and general manager of the Remington Arms Co., Inc. Milton Kutz, director of sales, has been made assistant general manager of the R. & H. department, Dr. Rykenboer's former post. The latter held important positions in the Roessler & Hasslacher Chemical Co. before it became a du Pont subsidiary, first as general superintendent and later vice president. Mr. Kutz also has had a wide experience with R. & H., having been successively branch office manager, general sales manager, and vice president and manager of sales.

Impervious Varnish Co., with factory at Rochester and principal office at 436 Seventh Ave., Pittsburgh, Pa., manufactures varnishes, pyroxylin lacquers, and enamels that are used in the rubber industry. Adam E. Daum is president; Edward H. Fay, vice president; Hugh Prentice, secretary; and Albert H. Braun, treasurer.

The Baird Rubber & Trading Co. is now located in new headquarters in the new Maritime Exchange Building, 80 Broad St., New York, N. Y. The executives of the company, all of whom have had long experience and are well known in the rubber trade, are Wm. T. Baird, Wm. T. Baird, Jr., and Collier Baird.

Harold L. Bache recently sold an extra membership on Commodity Exchange, Inc., New York, N. Y., to R. Henry Hirsch for another at a record price of $3,200.

NEW ENGLAND

Apex Tire Service Co. recently was opened by S. T. Moore at 33 Kilmarnock St., Boston, Mass.

The Hood Rubber Co. employes, Watertown, Mass., held their fifth annual outing at the United Shoe Machinery Country Club, Beverly, Mass., with over 500 present. Dinner, served in a large tent, was followed by a musical comedy. Baseball and outdoor games filled out the program thoroughly enjoyed by all.

The Firestone Tire & Rubber Co., Akron, O., held its Boston, Mass., district sales conference at Hotel Statler last month with over 200 dealers present. A. T. McGrath, district manager, presided. It was reported that company factories at Akron, Los Angeles, New Bedford, and Fall River are working on a 3-shift basis, and the feeling was one of general widespread optimism.

Gould Golf Ball Co., Inc., 522 Main St., Wakefield, Mass., makes Pro-Rite, Trek, Sovereign, Gold Circle, Blu-J, and Hi-Ball golf balls. Executives include Harold I. Gould, president; M. Joseph Durkin, vice president; H. R. Crocker, secretary; and Clarence C. Bartlett, treasurer. The company maintains a branch at 977 Sixth Ave., New York, N. Y.

NEW JERSEY

Business has improved considerably in New Jersey plants during the past month. Factories have received many orders for all kinds of mechanical goods; while production of tires has increased. Hard rubber production is also improving. Prices for casings and tubes have been raised. Many rubber companies have been compelled to adopt 2 and 3 shifts. Future prospects are good.

Harold E. Jenkins, assistant sales manager, Firestone Tire & Rubber Co., Philadelphia, Pa., recently addressed sales and advertising managers at the Trenton Chamber of Commerce. Luncheon followed the meeting.

The Pocono Co., Trenton, now runs a day and a night shift. Vice President William H. King declared the concern has taken on all its former employes besides additional help. Aside from its domestic trade, national in scope, Pocono exports to South America, Canada, and England

The Murray Rubber Co., Trenton, receiver and vice president, Alfred H. Branham, was summoned before Judge Philip Forman in the Federal Court, May 26, to show cause why the plant should not be sold. Creditors holding claims aggregating $2,000,000 opposed the move to dispose of the factory and terminate the receivership. S. L. Rosenberry, representing the National Bank of Kentucky, a claimant for $826,000, lauded the Murray receiver for having pulled the plant out of depression and produced a profit. After hearing arguments, Judge Forman decided to allow Murray to continue under receivership. The company has announced a 5% rise in wages with an added notice that further increases may be expected in a short time. Murray is running near capacity with 2 shifts. Old employes who were laid off when orders diminished are being recalled.

Joseph Stokes Rubber Co., Trenton, because of much new business received during the past month has increased its working hours. The Canadian plant also is busy.

The Rubber Manufacturers' Association of New Jersey was compelled to postpone its annual summer meeting and outing, originally scheduled last month at the Trenton Country Club, because of the illness of certain members and the out-of-town absence of others.

Luzerne Rubber Co., Trenton, has increased its working hours on hard rubber products. President Bruce Bedford recently was renamed a director of the United New Jersey Railroad & Canal Co. C. Dudley Wilson, Luzerne secretary-treasurer, has recovered sufficiently to leave Mercer Hospital, where he was seriously ill after an operation.

Prominent Factory Manager

A successful career covering 3 decades devoted to the rubber industry is the proud record of James P. Flynn, assistant treasurer and factory manager of the Puritan Rubber Mfg. Co. and the American Tile & Rubber Co., both of Trenton. He was born in Stoughton, Mass., on November 22, 1887, and attended the local parochial school, St. Mary's.

In 1903 at the Plymouth Rubber Co., Stoughton, appeared James Flynn, who became assistant foreman of the press department. Three years later he joined the B. & R. Rubber Co., North Brookfield, Mass., where he remained for a year. Then he entered the employ of the C. C. C. Hose & Rubber Co., Canton, Mass., as assistant mill room foreman. He left there in 1912 and for some time during 1914 was foreman of the braiding and press departments of the Bay State Insulated Wire & Cable Co., Hyde Park, Mass.

Next he went to the Panther Rubber Mfg. Co., Stoughton, as night superintendent. From 1915 to 1919 Mr. Flynn acted as superintendent of the Panther Rubber Co., Ltd., Sherbrooke, P. Q., Canada, but then returned to his former position with Panther in the States. In 1920 he was made superintendent of the Panco Rubber Co., Chelsea, Mass. The next year, however, found him in Trenton, the superintendent and factory manager of the Puritan plant.

Mr. Flynn belongs to the B. P. O. E. 105 Trenton. He lives at 104 Newell Ave. in Trenton.

John Waldron Corp., with main office and works at New Brunswick, and branch offices in New York, N. Y., Chicago, Ill., and Portland, Ore., manufactures embossing machines for all rubberized products, latex impregnating top coating of artificial leather, and other converting requirements.

Puritan Rubber Co., Trenton, reports greatly improved business, with prospects for normal conditions for the remainder of the summer.

Mercer Rubber Co., Hamilton Square, finds business much better and has a large number of orders for mechanical goods.

Pierce-Roberts Rubber Co., Trenton, now operates with 2 shifts. Many new orders will keep the plant busy for some time.

The Thermoid Co., Trenton, recently signed a 5-year contract with the Oil Well Supply Co., a subsidiary of the United States Steel Corp., whereby the Oil Well company will distribute all of Thermoid's rubber products for the oil industry in the United States and foreign countries.

Rubberhide Co., Inc., Trenton, manufactures Rubberhide rubber boots with renewable soles. Officers are James E. MacDonald, Jr., president; Frederick B. Williamson, Jr., vice president; George B. Wood, secretary-treasurer; and Samuel Cadwallader, purchasing agent.

U. S. Crude and Waste Rubber Imports for 1933

	Plantations	Latex	Paras	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Totals 1933	Totals 1932	Balata	Miscellaneous	Waste
Jan. ....tons	30,123	680	297	10	..	..	..	31,110	31,298	8	516	..
Feb.	18,407	246	217	5	..	..	..	18,875	30,546	16	483	1
Mar.	27,074	528	269	8	..	..	..	27,879	42,382	49	836	..
Apr.	18,436	654	369	..	..	..	..	19,459	37,017	14	463	10
May	26,770	629	147	10	..	..	..	27,556	32,224	47	628	..
Total, 5 mos., 1933 .....tons	120,810	2,737	1,299	33	..	..	..	124 879	......	134	2,926	11
Total, 5 mos., 1932 .....tons	171,061	1,565	718	123	..	..	..	......	173,467	323	3,240	105

Compiled from The Rubber Manufacturers Association, Inc., statistics.

Imports by Customs Districts

	April, 1933 *Crude Rubber Pounds	April, 1933 *Crude Rubber Value	April, 1932 *Crude Rubber Pounds	April, 1932 *Crude Rubber Value
Massachusetts	4,522,854	$138,257	5,965,269	$238,406
New York	36,977,786	1,079,604	67,425,085	2,542,155
Philadelphia	384,924	10,835	369,600	12,887
Maryland	2,234,691	61,434	1,245,988	39,315
Georgia	......	......	586,333	19,597
Los Angeles	2,682,227	70,938	9,312,375	337,191
San Francisco	78,400	3,920	951,969	26,569
Oregon	11,200	448	11,200	570
Ohio	......	......	216	9
Colorado	224,000	6,449	268,800	11,041
Totals	47,116,082	$1,371,885	86,136,835	$3,227,740

*Crude rubber including latex dry rubber content.

FINANCIAL

Baldwin Rubber Co.

Baldwin Rubber Co., Pontiac, Mich., for 1932 reports net loss after expenses and other deductions, of $81,279 against a loss of $1,303 in 1931.

Dewey & Almy

Dewey & Almy Chemical Co., including Multibestos Co., both of Cambridge, Mass., for 1932 reports net loss after depreciation, but before write-down of working capital of foreign subsidiaries, $154,558, compared with $406,054 loss, after above allowances, the year before.

Gillette Rubber Co.

Gillette Rubber Co., Eau Claire, Wis., (controlled by United States Rubber Co.) and subsidiaries reports for 1932 net income, $31,796, contrasted with net loss in 1931 of $138,062, of which a substantial amount was caused by write-downs to cover decline in raw materials and to adjust outside securities to quotations of December 31, 1931.

Canadian Goodrich

Canadian Goodrich Co., Ltd., Kitchener, Ont., Canada, and subsidiaries controlled by B. F. Goodrich Co., Akron, O., reports for 1932 a net loss after depreciation, interest, and other charges, but before provision for loss on exchange, $136,431, compared with $448,527 loss after same allowances in 1931.

Firestone Companies

Firestone Tire & Rubber Co., Akron, O., and subsidiaries, including Firestone Service Stores, reports for 6 months ended April 30 a net loss after taxes, depreciation, interest, Liberian development expenditures, and other charges, $1,576,000. This is contrasted with a net profit of $1,639,739, equivalent, after preferred dividend requirements to 4¢ a share on 2,050,487 common shares for the 6 months ended April 30, 1932.

New Incorporations

Allied Rubber & Proofing Co., Inc., Kings Co., N. Y., June 13, capital 100 shares, no par value. J. Kamer, D. W. Hafer, and B. R. Wechsler, all of 305 Broadway, New York, N. Y. Rubber products of all kinds.

Coron Tire Co., Inc., Providence, R. I. Capital $25,000. H. C. Cranston, I. A. Coron, and J. R. Long.

Elfskin Corp., Worcester, Mass. 100 shares common stock, no par value. M. V. Gustafson, president; M. E. Power, 10 Nirch St., Worcester, Mass., treasurer; and L. McNamara. Manufacture rubberized cloth.

The Hope Rubber Co., Inc., Providence, R. I. Capital $25,000. H. M. Baker, 210 W. Exchange St., Providence, E. H. Mueller, and W. J. Goff.

Knight Mfg. Co., Cambridge, Mass. Capital $20,000. A. N. Tellier, president; R. M. Jones, 68 Beal Rd., Waltham, Mass., treasurer; and F. A. Welch, secretary. Rubber goods.

Latex Exporters, Inc., Manhattan, June 22, capital 100 shares, no par value. J. Kaslow and L. E. Pleninger, both of 261 Fifth Ave., and H. S. Dane, 200 Fifth Ave., all of New York, N. Y. Rubber goods, latex products, etc.

The Lowell Covered Rubber Thread Co., Inc., Lowell, Mass. Capital $50,000. A. J. Lefbore, 270 Gibson St., Lowell, president; T. Rochette and Z. A. Normandin.

The Marcus Wire & Cable Co., Boston, Mass. Capital $20,000. I. H. Marcus, treasurer; F. Freundich, Winthrop, Mass.; and M. G. Levenson.

Northern Rubber Products Co., Andover, Mass., capital 1,000 shares common stock, no par value. J. A. Jenkins, 1855 Beacon St., Brookline, J. W. Walsh, and M. R. Sweeney.

Rubber Board Floors, Inc., Syracuse, N. Y. $15,000. F. P. Arnold, 188 Hull Ave., and J. D. Enright, Jr., 304 Parkway Dr., both of Syracuse, and W. W. Dibble, 11 Everingham Rd., Nedrow, all in N. Y. Goods, wares, and merchandise.

OBITUARY

C. W. Bedford

Prominent Chemist

THE rubber industry lost an important figure on June 19 when death claimed Clayton W. Bedford, who suffered complications following an appendicitis operation. Mr. Bedford joined The B. F. Goodrich Co., Akron, O., March 8, 1922, as research chemist and on August 15, 1926, was appointed manager of compounding research. On January 1, 1932, he began special experimental work in the tire division, devoting most of his time to applying rubber to railroad wheels. The result is the cushion wheels Goodrich built for auto trams.

The deceased was born June 13, 1885, at New Windsor, Ill. He received a B.S. in chemical engineering from the University of Michigan in 1910. He served also as a research chemist with the Western Electric Co., New York, N. Y., and as instructor in organic chemistry at the Case School of Applied Science, Cleveland, O. From 1912 until he went to Goodrich, Mr. Bedford was a research chemist with the Goodyear Tire & Rubber Co., Akron.

He was the coauthor of many papers on rubber chemistry and the patentee of several inventions on accelerators. For some time he was editor of *The Shift Hunter's Letters* dedicated to stamp collecting, for which he was well known. Mr. Bedford belonged to the Masons, American Chemical Society, American Philatelic Society, the Rubber City Stamp Club, Akron, and the Garfield Perry Stamp Club, Cleveland.

Surviving are his widow, his father, a son, and a daughter.

Funeral services were held on June 21. Interment was in Mt. Peace Cemetery.

Canadian Executive

A HEART attack, while he was returning from a business trip from South Africa, caused the death in London, England, on May 22 of James Saurin McMurray, assistant export manager of Gutta Percha & Rubber, Ltd., Toronto, Ont., Canada. He was associated with the company about 37 years and visited the 4 corners of the globe as an export official.

During the World War, Mr. McMurray served on the headquarters staff of the Royal Canadian Engineers as captain. A yachtman, he was internationally known and sailed in many important races as a prominent member of the Royal Canadian Yacht Club.

Goodyear Executive

FOLLOWING a 2-month illness, Joseph D. Farrell, 58, manager of the dealer relations department, Goodyear Tire & Rubber Co., Akron, O., died June 11. Prior to coming to Goodyear 13 years ago he served for several years in the government's postal service, which he joined after 2 years at Denver University.

The deceased is survived by his widow, 2 sons, and a daughter. Funeral services were held on June 14. Burial was in Holy Cross Cemetery. Several Goodyear executives acted as pallbearers.

EDITOR'S BOOK TABLE

New Publications

"Prices versus Production." Farrel-Birmingham Co., Inc., Ansonia, Conn. This booklet editorial is the second in a series by Allen W. Rucker in collaboration with N. W. Pickering, president of Farrel-Birmingham. The authors discuss briefly the causes of declining production. Volume production and price are controlling factors determining income. Thus the gross dollar income index is reached by multiplying the price index by that of physical volume. It is found that "The low level of dollar sales is now less the effect of low prices than it is of restricted volume of business." The evident remedy called for now is price equalization by readjustment of those rates now out of line with underlying commodity prices.

"Reduction Gears." The Poole Foundry & Machine Co., Woodberry, Baltimore, Md. This illustrated and descriptive catalog 33-RG sets forth the outstanding features of this company's reduction gears and gives technical data in detail on how to select the right gear. The simplified form in which all data, dimensions, and rating tables are laid out will be appreciated greatly by progressive rubber plant engineers.

"Link-Belt Roller Chains Data Book 1457." Link-Belt Co., Indianapolis, Ind. This indexed book of 264 pages comprises complete classified data to assist in the proper selection and application of finished steel roller chains and wheels for the fields of usefulness to which they are best adapted. Many power transmission applications are pictured, featuring the use of link-belt roller chains.

"Hard Rubber Compounding. Laboratory Report No. 163," E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. This report from the Organic Chemicals Department of the du Pont Rubber Laboratory differentiates between "hard rubber" and "ebonite," outlines the methods of vulcanization used, tabulates the effect of loading on allowable steam pressure for non-blowing cure, and discusses the effect of various pigments including zinc oxide, etc. Practical formulae are given for various black hard rubber articles and for colored hard rubber stocks.

"1933 Year Book." The Tire & Rim Association, Inc., 1401 Guarantee Title Bldg., Cleveland, O. This official publication of 75 pages contains full and authoritative data on tires, rims, gages, etc., for automotive use. The information is arranged as it applies to the following classifications of equipment: namely, passenger car, truck and bus, motorcycle, airplane, and tractor.

Book Reviews

"The Preparation and Crystallization of Pure Ether-Soluble Rubber Hydrocarbon: Composition, Melting Point, and Optical Properties." By W. H. Smith, Charles Proffer Saylor, and Henry J. Wing. Research Paper No. 544, Reprint from Bureau of Standards Journal of Research, Vol. 10, April, 1933.

The purpose of this study, as stated in the introduction, was to develop a technique for applying systematic crystallization in the investigation of the constitution of rubber hydrocarbon.

The paper is illustrated with pictures of special apparatus and photomicrographs.

"Factory Reorganization." By Thos. W. Fazakerley. Gee & Co., Ltd., 6 and 8 Kirby St., London, E. C. 1, England. 1933. Cloth, 96 pages, 5½ by 8½ inches. Indexed. Charts.

This practical exposition of factory organization and cost accounting is particularly timely and useful in view of the rehabilitation of industry. The author discusses plant organization in 10 chapters as follows: The Analysis of Labor; Storage of Materials; Basis of Wages Payment; Science of Purchasing; Overhead Expense; Departmental Returns and Reports; Factory Maintenance Costs; Manufacturing Orders; Departmental Supervision; Administrative Personnel. The book is well indexed.

The Vanderbilt News. R. T. Vanderbilt Co., 230 Park Ave., New York, N. Y. The May-June, 1933, issue presents a comprehensive experimental record illustrated with many graphs relating to the effect of 3- and 23-volume loadings of various reenforcing agents, fillers, and pigments on the physical properties of a pure gum compound.

The Givaudanian. June, 1933. This is an issue of the house organ published monthly by Givaudan-Delawanna, Inc., manufacturer of aromatic chemicals, 80 Fifth Ave., New York, N. Y., in the interests of the perfume, cosmetic, drug, food, and allied trades. This interesting number is replete with trade news, laboratory notes, and other helpful hints for those interested in all sorts of aromatics and their use in rubber goods.

"The Rubber Industries," Census of Manufactures 1931. Final Reports Comprising Rubber Tires and Inner Tubes; Rubber Boots and Shoes; Rubber Goods Other than Tires, Tubes, Boots and Shoes. This is a pamphlet of 10 pages issued by U. S. Department of Commerce, Bureau of Census, Washington, D. C.

World Rubber Absorption—Net Imports

	Long Tons—1933		
CONSUMPTION	Feb.	Mar.	Apr.
United States	21,638	18,047	26,226
United Kingdom	5,982	4,498	7,272
NET IMPORTS			
Australia	2,001	1,904	1,580
Austria	153	196	196
Belgium	1,670	952	...
Canada	1,175	1,114	555
Czechoslovakia	681	688	400
Denmark	75	66	146
Finland	10	60	61
France	6,603	6,093	6,308
Germany	4,460	4,425	4,805
Italy	994	1,604	2,215
Japan	8,508	6,035	5,495
Netherlands	375	282	163
Norway	98	184	92
Russia	2,820	2,088	...
Spain	132	340	...
Sweden	381	339	307
Switzerland	45	106	32
Others	*1,450	*1,450	*1,450
Totals	59,251	50,471	...
Minus U. S. (Cons.)	21,638	18,047	26,226
Total foreign	37,613	32,424	...

*Estimate. *Compiled by Rubber Division, Washington, D. C.*

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

No.	Commodity	City and Country
*†4,355	Carbon black	Cologne, Germany
*†4,390	Rubber soled canvas shoes	Istanbul, Turkey
*†4,391	Rubber thread for elastic fabrics	Lodz, Poland
*†4,392	Tire repair materials	Milan, Italy
*†4,394	Carbon and lamp blacks	Catania, Italy
*4,401	Rubber thread	Viersen, Germany
*†4,405	Rubberized fabrics	Buenos Aires, Argentina
*†4,414	Elastic webbing	Antwerp, Belgium
*4,439	Bicycle tires and tubes	Kingston, Canada
*†4,440	Rubber hose	Levallois-Perret, France
*†4,464	Druggists' sundries	Winnipeg, Canada
*†4,465	Toys and golf clubs and balls	Winnipeg, Canada
*†4,488	Gloves, hot water bags, aprons, sponges, and other sanitary goods	Malaga, Spain
*†4,499	Rubber goods	Kingston, Jamaica
†4,528	Soles and heels	Izmir, Turkey
†4,549	Soles and heels	Sanvic, France
†4,577	Sheeting and other sanitary goods	Dublin, Ireland
†4,583	Surgical gloves and other dipped goods	Prague, Czechoslovakia
†4,592	Belting	Vienna, Austria
*†4,614	Rubber mold paste	Venlo, Netherlands
*†4,615	Druggists' sundries	Barranquilla, Colombia
*†4,660	Surgical goods and rubber hosiery	Prague, Czechoslovakia
*†4,661	V-type belting	Milan, Italy

*Purchase. †Agency. *†Purchase or agency.

Canada's April Imports

Crude rubber, one of the most important articles of Canadian commerce, to a very limited extent comes direct from the country of origin. Thus April imports were 1,243,621 pounds, value $51.165; 1,241,051 pounds came from the United States and 2,570 from Great Britain. Once in a while the Dominion secures some rubber direct from such producing countries as the Straits Settlements, but none was received in April. The raw rubber imports were much less than the 2,493,430 pounds in March and 3,584,609 in April, 1932.

Rubber Industry in Europe

GREAT BRITAIN

Chlorinated Rubber

"No Illusions about Chlorinated Rubber" was selected by Wilhelm Krumbhaar, director of the German Varnish Makers' Institution, as the subject of his lecture at the Paint Research Station, Teddington, May 25. When about 2 years ago the use of chlorinated rubber was suggested for paint, great hopes were entertained that a product would be developed having all the good and none of the bad qualities of rubber. In Germany a great number of tests were made to this end. At present 4 different kinds of chlorinated rubber are available there, which greatly resemble sawdust, except one type which looks like loose wadding.

The investigations so far have not yielded very encouraging results, and a much more cautious attitude toward chlorinated rubber paint has developed in Germany. The most serious defects of chlorinated rubber paints are poor adhesion and poor resistance to weather. Contrary to all expectations, pure chlorinated rubber films possess no elasticity and are brittle. The swelling resistance of these films to water and aqueous solutions of alkali and acids is low; as to solvents the films resist only alcohol and mineral spirits, but not benzol and other hydrocarbons. They do not burn with an open flame, but char; however they can be destroyed by fire. Their stability to light and heat is imperfect; they easily decompose at temperatures of 150°.

These defects can to a certain extent be remedied if suitable soft resins and pigments are added to the pure chlorinated rubber when a paint can be obtained which is very water resistant, usually resistant to chemical and mechanical influences, and is also non-inflammable. But the practical uses for such paints is limited as apparently neither adhesion nor weather resistance is greatly improved. Thus such paints can be used to protect cement and stone from acids, but the adhesion is poor; they protect metals against chemical action, but not against weather, and the metal surface must be quite rough for the paint to adhere properly; there is little advantage in using them on wood, and applied to fabrics, they considerably reduce tearing resistance. Finally the paints will not always prevent rusting especially on pipes used underground.

In connection with the above views it is interesting to note that J. Rinse, lecturing on Tornesit before a meeting of the Section for Industrial Chemistry at Amsterdam, Holland[1], was much more encouraging, particularly about the adhesion of Tornesit. He stated that by adding suitable softeners and pigments, varnishes could be obtained having adhesiveness, elasticity, hardness, and rapid drying power. Tornesit varnishes, he asserted, combine the good qualities of oil paints and nitrocellulose varnish. His own experience showed that Tornesit and a suitable softener gave good protection to pipes laid in peat soils; while tests in using it on roofs indicated better protection against rust than given by oil paints.

In conclusion it may be added that according to *The India Rubber Journal* the German firm, T. H. Goldschmidt, Essen, has started manufacturing Tegofan, a chlorinated rubber, on a large scale at Ammendorf near Halle. A special sales company, Tegofan G.m.b.H., has been established at Hamburg.

[1]See *Chem. Weekblad*, Feb. 25, 1933.

Restriction Views

Sir Eric Geddes, chairman of the Dunlop Rubber Co., and Eric Miller, chairman, Harrisons & Crosfield, have been criticizing each other's views on restriction. While they both agree that the troubles of the producer are chiefly due to Dutch native rubber and that competition from that side must be rendered impossible, Sir Eric sees a bad matter made worse by restriction and finds the only solution to the problem in producers adopting up-to-date planting methods and reducing costs to such a low level that the Dutch native could not compete.

The Dunlop Plantations, it should be noted, reduced costs to 2.178 d. a pound last year, and for the present year costs are put at under 2 d., f.o.b. The first of the company's budded areas will come into tapping next year, and on the basis of test tappings it is expected that f.o.b. costs on these areas will be little more than 1 d. a pound and all-in costs 1¾ d. a pound.

Mr. Miller would also meet Dutch native competition by raising the efficiency of the estates. But, he points out, the majority are not in a position to carry out suitable planting programs; so he advocates a period of regulated supplies to help improve prices and thus enable producers to improve their plantations.

While the potential output of Dutch native rubber has been put at over 300,000 tons a year, nothing like this has ever been attained, and last year only about 60,000 tons were available from this source. So it seems 60,000 tons of native rubber stand in the way of prosperity for the estates. To eliminate these, large scale bud grafting and greatly increased production by estates is advocated. Then presumably after the Dutch natives have been eliminated, the next step will be for estates to eliminate each other.

Tire Production

The Rubber Growers' Association has compiled tables showing the absorption of crude rubber in 1932. One of these, given below, analyzes the market for pneumatic tires in the United Kingdom for 1928-1932 inclusive, giving data regarding tire production and the number of tires for original equipment and replacement.

It will be seen that the replacement demand in 1932 was the lowest in the period considered, but the demand for original equipment and the export of loose casings both reached record heights.

The replacement rate, when compared with the number of pneumatic-tired vehicles re-registered (that is total registrations less new registrations), shows a continuous reduction since 1928. The rates were 3.45 casings per vehicle in 1928, 2.79 in 1929, 2.22 in 1930, 2.20 in 1931, and 1.90 in 1932.

British Notes

The North British Rubber Co., Ltd., reports a loss of £34,896 for 1932. No dividends will be paid on the 5% cumulative preferred shares, which are

United Kingdom Tire Statistics

Year	Production	Net Imports of Loose Casings	Exports of Loose Casings	Required for Original Equipment	Casings Available for Replacement
1928	5,013,000	129,000	880,000	1,030,000	3,302,000
1929	5,403,000	120,000	1,282,000	1,170,000	3,071,000
1930	5,197,000	96,000	1,385,000	1,170,000	2,738,000
1931	5,039,000	50,000	1,167,000	1,122,000	2,800,000
1932	5,193,000	38,000	1,411,000	1,199,000	2,621,000

in arrears since June, 1930. The company has been hard hit by Japanese footwear competition. However the new year is reported to have begun more favorably, and the works are busy.

The British Goodrich Rubber Co., Ltd., declared an interim dividend of 2½% on the ordinary shares, the first interim dividend by the company.

The Rubber Industry Bill passed the House of Lords.

Rubber mooring buoys for seaplanes and flying boats, designed by Short Bros. and manufactured by the India Rubber, Gutta-Percha & Telegraph Works, have had satisfactory tests by the Royal Air Force and are to be tested further under tropical conditions in the East. In addition the Medway Conservancy has also ordered a large number of the buoys for mooring river craft. The new buoys are of spongy rubber treated to resist salt water and tropical heat. Their use is said to prevent possible damage to seaplanes when they drift against the buoys.

Other European Notes

It is reported that the Czechoslovakian tire cartel is being menaced by the activities of the Bata concern. This firm has recently taken up the manufacture of automobile tires and has put them on the local market at such a low price that it has captured a large part of the business here while the members of the cartel note a corresponding decrease in their sales. Consequently the price agreement has had to be suspended; and though new negotiations will be started again in an effort to save the cartel, these appear doomed to failure.

As a result of reorganization, the Dansk Galoche og Gummifabrik A. S., Copenhagen, Denmark, is able to report a net profit of 300,483 kroner for the past year, thereby reducing the loss carried forward the previous year to 651,189 kroner.

Goodyear Tire & Rubber Co. of Poland, Warsaw, has reduced its capital from 500,000 to 250,000 zloty to balance losses.

Compagnie Francaise du Caoutchouc, France, reports loss of 545,155 francs for 1932, bringing the total deficit to 3,887,565 francs.

Manufacture Liegeoise de Caoutchouc O. Englebert Fils & Cie., Belgium, booked net profits of 480,134 francs against 6,521,019 francs in 1931. The result was obtained after writing off 7,654,870 francs for bad claims and loss on exchange. No dividend will be declared.

Compagnie Bergougnan Belge, Belgium, closed its 1932 balance with a loss of 5,612,771 francs after writing off 5,621,376 francs against claims, stocks, and equipment.

GERMANY

			Consumption—Tons		Production—Tires for	
Year	Works	Employes	Crude Rubber	Reclaim	Cycles	Motor Vehicles
1912	21	8,975	5,357	....	15,066,000	1,283,000
1925	33	11,930	15,581	2,033	22 954,000	3,106,000
1926	24	7,122	11,540	2,891	19,227,000	2,304,000
1927	23	11,947	18,153	4,415	31,383,000	3,634,000
1928	23	8,977	20,018	3,877	23,659,000	4,732,000
1929	21	9,166	28,776	5,049	21,921,000	4,947,000
1930	20	7,626	16,472	2,102	20,309,000	4,022,000
1931	18	8 124	16,103	4,682	26,277,000	3,720,000

IMPORTS AND EXPORTS OF MOTOR TIRES

	Imports		Exports	
	Number	Value	Number	Value
1925	53,200	M. 2,314,000	398,100	M.14,020,000
1926	351,000	11,701,000	432,500	18 266,000
1927	572,000	23,791,000	351,600	16,436,000
1928	514,800	21,761,000	364,600	19,088,000
1929	592,400	21,286,000	565,500	28,528,000
1930	482,100	17,655,000	553,500	25,687,000
1931	259,900	8,876,000	339,500	14,996,000
1932	55,100	1,705,000	254,700	9 413,000

German Tire Industry

Valuable figures of the German tire industry, chiefly covering the period 1925-1931, are published in *Wirtschaft und Statistik*. These data show that while the peak of German production of tires for motor vehicles was reached in 1929 when the total, including solid tires, was 4,947,000, output of cycle tires started to fall after 1927 when the maximum of 31,383,000 was reached. It is interesting to note, however, that while output of cycle tires in 1930 was below even that of 1925, production in 1931 was up 30% as compared with 1930 and higher than that for any year since 1925 except 1927. This condition is ascribed to the fact that the reduced purchasing power of the population has caused people to buy fewer motor cycles and more bicycles.

The output of tires for motor vehicles in 1931 was not much below that of 1930; whereas the decrease in 1930, compared with 1929, had been about 20%. About 2/3 of these tires were pneumatics for passenger cars.

In 1931 the tire industry absorbed 16,103 tons of crude rubber, about 40% of the total German imports of crude rubber for the year; in 1929, however, the industry used 28,776 tons of crude. The number of tire factories reached a maximum of 33 in 1925, which employed 11,930 persons against 18 employing 8,124 in 1931.

Only a small part of the tire output is exported, less than 10%, mostly pneumatics for automobiles; the chief markets are Holland, India, and Switzerland, and for cycle tires also Denmark. Exports to Argentina, once one of Germany's best customers, were negligible in 1932. Tire imports have also dwindled considerably; in 1929 the total of tires for motor vehicles was 592,400, value 21,286,000 marks, in 1932 this was only 55,100, value 1,705,000 marks. One-third of these goods is supplied by Belgium. The share of the United States, which in 1927 had been 46%, fell to 7% in 1932.

The table shown above offers a good survey of the industry.

German Notes

A cartel of German footwear manufacturers has been established to fix prices and terms for the retail trade of rubber soled footwear. The following firms have already joined: Harburger Gummiwarenfabrik Phoenix A.G.; Hanauer Gummischuhfabrik Westheimer & Co.; Romika A.G. Schuhfabrik; Gummiwerke Elbe A.G.; Gummiwerke Hutchinson; Standard Marienburger Gummiwerke A.G. Negotiations with other companies are about to be concluded.

Following the dismissal of Jewish employes in their departments, Professor Polanyi and H. Freundlich have given up their positions at the Kaiser Wilhelm Institute of Physical Chemistry, Dahlem, Berlin.

Messrs. Goldschmidt, Coppel, Seligmann, and Magnus are no longer directors of the Continental Gummiwerke A.G., Hannover.

Deutsche Hydrierwerke A.G. has found that ester mixtures from univalent aliphatic alcohols and saturated organic mono-carbonic acids are excellent for dissolving rubber and nitrocellulose at the same time, if the esters contain at least 6, but less than 12 carbon atoms in the molecule. Ester mixtures obtained by condensation of at least 2 saturated aliphatic aldehydes by means of catalyzers, especially alcoholates, are used.

If to mixings containing 100 parts of crude rubber and 30 to 40 parts of Arrow black are added 60 to 90 parts of Thermax, a compound is obtained which is easy to force on the tubing machine and which, when vulcanized for a very short time, yields leather-like vulcanizates with good resistance to tearing.

Rubber Industry in Far East

NETHERLANDS EAST INDIES

Concentrated Rubber

The A.V.R.O.S. has applied for a patent for preparing concentrated rubber dispersions by creaming latices. In the usual methods alkaline carbonates, extracts of carragheen moss, etc., or colloidal substances like glue, gelatin, pectin, etc., are added to the latex to effect separation, and sometimes the latex is heated to facilitate the process. The new creaming process can be improved as to yield and speed if the latex is dehydrated either by steam or formaline, before the creaming substance is added. With either steam or formaline the creaming is completed 24 hours after dehydration when top layers containing 62 to 63.5% of dry rubber result. Another advantage for this method is the aseptic and antiseptic action on the dispersion of the dehydration agents, steam and formaline, whereby the keeping qualities are improved.

Anticoagulants, protective colloids, antioxidants, accelerators, fillers, and colors may be added as desired.

More Estates Tapping

Available figures show that the areas out of tapping in the Dutch East Indies are steadily decreasing. After having reached a maximum of 31% of the tappable area in August, 1932, the percentage of untapped acreage has gradually dropped and at the end of February, 1933, averaged 18.8% for all Netherlands Indies; 17.5% for Java and Madura; and 19.7% for the Outer Provinces. This trend is further noticed in the frequent announcements of estates reopening. Quite recently 2 more estates resumed tapping.

Export figures have been fluctuating, but April, 1933, shipments from Sumatra were 14,126 tons against 11,202 in April, 1932. Those from Java and Madura fell from 6,830 to 5,310 tons, but the total for the month still shows an increase when compared with April 1932, that is 19,436 against 18,032 tons.

Native Rubber

The thirteenth report on native rubber in the Dutch East Indies, covering the fourth quarter of 1932, indicates that in most districts the trend away from rubber toward foodstuffs is continuing. It does not appear, however, from the data that rubber is being felled to any appreciable extent.

In most districts the decrease in exports during 1932 as compared with 1931 and the peak year 1929 has been considerable: over 75% and as high as 99%. Djambi, West Borneo, and Riouw have best maintained their shipments, the reduction in exports when compared with 1931 representing 17 to 20% and with 1929, 20 to 23%. The average decline for all native rubber was 30% against 1931 and 43% against 1929. But compared with potential outputs, the decrease in exports has been still more striking as the following table shows:

Year	Potential Output, Tons	Exports	Exports in % of Potential	Price per ½ Kg. Sheets, Guilder Cents
1927	100,000	100,401	100	99
1928	110,000	91,353	83	58½
1929	120,000	108,583	90	54
1930	150,000	90,496	60	30¾
1931	200,000	88,717	44	15
1932	250,000	62,381	25	7½
1933	300,000	......	..	....
1934	325,000	......	..	....
1935	350,000	......	..	....

Exports of remilled rubber from the Dutch Indies have also fallen considerably. In 1929, 24,097 tons of the total were remilled rubber, but in 1932 the amount was 13,024, a drop of 46%. Various remilling companies had to stop operations entirely, including the Nederlandsche Rubber Unie.

In conclusion the report points out that the natural restriction of the Dutch natives, when calculated on potential, came to 75% and on exports of 1931 to 30%; while exports of Malayan native rubber also showed a greater decline in 1932 than did exports from estates, so that the natives, especially those of the Netherlands Indies, have contributed most to a natural restriction of outputs.

Yields from Selected Seedlings

An article in the *Indische Mercuur* by C. M. Hamaker gives details regarding a small, up-to-date rubber estate planted with seeds from Heveas known to be above the average producers, but still not exceptionally good. The estate, favorably situated as to climate, has a fair soil; the land is gently undulating, but 13% is quite flat and marshy and could not be completely drained. The yields from this last section have always been backward, thus depressing the average over all. The land had formerly been used by the neighboring natives; it was improved by green manuring, but actual fertilizers have never been applied. In January, 1917, 42.6 hectares were planted up, and a year later another 16.3 hectares, originally with 200 per bouw (bouw equals 1.75 acres). This number was later thinned out, and in 1923 and 1924 the spaces were planted with seed from very good yielders. By 1931 the tappable stand per bouw was about 90 old and 10 younger trees.

The plantation is managed by a Sundanese, a European visiting it only once a month for a few hours to inspect and direct the work. At first 12 tappers were required, but later, when tapping was changed to once in 3 days, only 8 tappers were needed. Outputs have been increasing steadily, and the yield per hectare was 812 kilos dry in 1931 and is put at 850 kilos for 1932, or 5.8 and 6 kilos dry per tree respectively. Thinning out and supplying with superior material continues, and it is expected to obtain 1,000 kilos per hectare before long, when it is figured costs will not exceed 12.5 cents per kilo.

Commercial Budded Areas

Over against these results it is interesting to put recent figures from commercial areas of buddings quoted by J. S. Vollema at a recent meeting of planters. On the Bodjong Datar estate, Java, an area of 22½ hectares was planted with BD2, BD5, and BD10 and, when 6 years old, the trees yielded at the rate of 453 kilos per hectare, or 1.8 kilo per tree. On the Aloer Djamboe and Batang Trap estates in East Coast Sumatra, one area of 107 hectares planted chiefly monoclone with AV36 and partly with AV36 mixed with other AV clones, an output of 378 kilos per hectare, or 1.9 kilos per tree, was obtained when the trees were in their sixth year. One section, covering 49 hectares on the same plantation and consisting of monoclone AV36, yielded 610 kilos per tree in the seventh year. An area of 17 hectares of mixed AV clones on inferior soil gave 479 kilos per hectare, or 2.3 kilos per tree.

On the estates of the Holland American Plantations Co., 2 hectares of unproved H.A.P.M. clones yielded 1,238 kilos per hectare, or 5 kilos per tree, in the ninth year, and 1,628 kilos per hectare, or 6.5 kilos per tree in the tenth year. In addition 80 hectares of unproved H.A.P.M. clones gave 1,121 kilos per hectare, or 4.7 kilos per tree, in the tenth year. Finally Vollema gives confidential figures of a plantation which in the ninth year produced 5.7 kilos per tree and 1,529 kilos per hectare.

It will be noted that while the yield per hectare of the buddings is considerably in excess of those from the seedlings, probably because of the difference in planting distances, the yield per tree of the seedlings compares rather well with the yield per tree of the buddings, so far.

Emergency Measures

Details of the crisis regulations for rubber and other hill cultures have now been published. The measures are operative until January 1, 1936. As far as rubber is concerned, they provide that no hill estate run in European fashion may transport rubber or latex beyond the boundaries of the estate without a permit from the so-called Rubber Crisis Central. Any estate falling within the terms of the provisions which transports rubber without the necessary permit is liable to a maximum penalty of 3 months' imprisonment or 3,000 guilders fine. The fee for the permit, renewable every year, is based on the annual output; a fixed rate, yet to be determined, will be imposed on every 100 kilos produced. The proceeds will be available for maintaining the private experiment stations and for propaganda work to promote the uses and consumption of crude rubber and latex. The estates receiving permits have the right to free membership in the Central Experiments Stations Association, to advice from the experiment stations, and to certain publications.

Testing Buddings

A new method of testing Hevea buddings has been devised by T. A. Tengwall, which consists in placing 2 buds from different clones on one stem. The advantage is that differences of stock and soil are eliminated as factors in the quality of buddings; while far fewer buddings per clone are required for testing. Incidentally, on April 1, 1933, Mr. Tengwall resigned from the West Java Experiment Station to return to Sweden.

World Rubber Shipments—Net Exports

	Long Tons—1933		
British Malaya	Mar.	Apr.	May
Gross exports ...	42,059	36,752	42,902
Imports	7,964	7,758	13,664
Net	34,095	28,994	29,238
Ceylon	4,905	4,582	*5,434
India and Burma..	389	272	....
Sarawak	571	624	1,091
British N. Borneo..	*400	*400	*400
Siam	304	235	359
Java and Madura..	5,092	5,226	....
Sumatra E. Coast..	6,466	5,969	....
Other N. E. Indies.	6,900	7,934	....
French Indo-China.	1,102	*1,053	*1,436
Amazon Valley	995	*600	....
Other America	....	....	....
Africa	*100	*100	*100
Totals	61,319	55,989	....

*Estimate. *Compiled by Rubber Division, Washington, D. C.*

MALAYA

Malayan Rubber Factories

A fairly wide range of rubber articles is produced by the few rubber factories in Malaya, the best known of which are the Singapore Rubber Works and Tan Kah Kee & Co., Ltd. The latter, with selling organizations in the East, does a fair export business chiefly in footwear and tires. The local rubber industry is using increasing quantities of crude rubber as is evident from figures furnished by the Rubber Growers' Association, according to which Malay's rubber absorption in 1932 was 2,395 tons against 1,521 in 1931 and 1,795 in 1930.

Despite the lack of skilled labor in Malaya, the quality of locally produced automobile tires has been steadily improved, and such tires are now available with a guarantee of 8,000 miles. The concern producing them has a capacity of 6,000 casings and 10,000 tubes a month, but for the last few years actual production has only been about 500 casings and 750 tubes a month. However during 1932 increased activity has been reported, and the present output is said to be 1,000 casings and 1,500 tubes a month. The firm in question also has facilities for producing 8,000 cycle tires daily, but the present daily output is 5,000. These not only find a sale in Malaya, but also in neighboring Far Eastern countries, especially South China.

The Rodorail

The Rodorail is a new transport system invented by W. J. Williams, director of Electrical Undertakings, F.M.S., the feature of which is that it enables motor vehicles to travel over railway lines under their own power. A specially designed bogie is employed to convey the motor vehicle along the railway lines; the former has 4 pairs of wheels. Two pairs are placed close together at each end of the bogie, and a rubber covered drum is attached to each wheel or forms part of the wheel. When the motor vehicle is to leave the road for the rails, it takes up a position so that the rear wheels rest between the 2 sets of drums, and it is then coupled to the bogie. The combined unit then proceeds along the rails controlled exactly as though the motor vehicle were still running on the road.

So far expense has prevented the building of an experimental bogie for testing the system practically, and only a working model of the Rodorail has been shown.

Leaf-Fall of Hevea

A well-known planter discussing the *Oidium* scare states that 3 years ago all the trees on his estate suffered from leaf disease, died back, and had practically no foliage at all. One area, however, happened to be manured, another limed, and these developed very strong foliage shortly after treatment. Forestry methods were then introduced on the rest of the estate, and since then no sign of leaf disease of any kind has been present in the areas where forestry reached the proper stage. The planter concludes from his experience that ordinarily leaf disease will not occur in healthy grown rubber and where soil conditions are kept in order, at least not in Malaya. He further suggests that *Oidium* may not be infectious.

Since it costs $3[1] an acre to combat leaf disease by the accepted method—an expense most estates cannot afford at present—it would be of the greatest advantage to planters if the above conclusions were scientifically tested to decide whether the disease can be fought by natural and, consequently, cheaper means.

[1] $1. S.S. currency=$.4712 in U.S. dollars during week of June 5-10, 1933.

Malayan Notes

The Sungei Sayong Rubber Co., Ltd., has announced that because of insufficient cash the estate has been closed down.

H. N. Whitford, manager of the Rubber Manufacturers Association crude rubber department, has been visiting the East Coast of Sumatra and Borneo and is expected at Penang and Singapore. After leaving Malaya, he is to return to Sumatra to go through the native rubber centers at Djambi and Palembang.

British Malaya

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Charing Cross, London, S.W.1, England, gives the following figures for May, 1933:

Rubber Exports: Ocean shipments from Singapore, Penang, Malacca, and Port Swettenham

	May, 1933	
To	Sheet and Crepe Rubber Tons	Latex Concentrated Latex and Revertex Tons
United Kingdom	7,089	118
United States	24,851	110
Continent of Europe ...	7,371	223
British possessions	663	14
Japan	1,951	12
Other countries	500	..
Totals	42,425	477

Rubber Imports: Actual, by Land and Sea

	May, 1933	
From	Dry Rubber Tons	Wet Rubber Tons
Sumatra	602	4,375
Dutch Borneo	739	5.337
Java and other Dutch islands.	223	33
Sarawak	1,056	35
British Borneo	276	39
Burma	285	33
Siam	188	171
French Indo-China	192	34
Other countries	38	8
Totals	3,599	10,065

Patents and Trade Marks

MACHINERY

United States

1,907,535. **Mandrel.** W. A. Gibbons, Montclair, and H. T. Battin, Ridgewood, both in N. J., assignors to Morgan & Wright, Detroit, Mich.
1,907,941. **Molding Apparatus.** H. M. Ehmann, assignor to Akron Bronze & Aluminum Co., both of Akron, O.
1,908,266. **Vulcanizer.** J. H. Matthews, Nutley, assignor to Raybestos-Manhattan, Inc., Passaic, both in N. J.
1,908,282. **Vulcanizer.** R. W. Brown, assignor to Firestone Tire & Rubber Co., both of Akron, O.
1,908,311. **Air Tire Spreader.** C. E. Branick, assignor to Branick Mfg. Co., Inc., both of Fargo, N. D.
1,908,563. **Punch Press.** W. H. Slabaugh, Cuyahoga Falls, and H. E. Waner, Akron, both in O., assignors to B. F. Goodrich Co., New York, N. Y.
1,908,564. **Plastic Material Remover and Conveyer.** C. Slusser, assignor to Goodyear Tire & Rubber Co., both of Akron, O.
1,908,666. **Heel Washer Distributer.** J. T. Gordon, assignor to Goodyear Tire & Rubber Co., both of Akron, O.
1,908,681. **Vulcanizing Press.** B. Bronson, Lakewood, assignor to Ohio Rubber Co., Cleveland, both in O.
1,908,690. **Bead Strip Roller.** G. F. Cavanagh, Cleveland, and E. M. Winegar, Willoughby, assignors to Ohio Rubber Co., Cleveland, all in O.
1,908,871. **Repair Tool.** C. Simpson, Walla Walla, Wash.
1,908,950. **Stripping Apparatus.** A. C. Bowers, Greensburg, and W. E. Humphrey, Jeannette, both in Pa., assignors to Pennsylvania Rubber Co., a corp. of Pa.
1,908,963. **Tire Patch Coating Apparatus.** M. E. Davis, Grand Rapids, Mich., assignor, by direct and mesne assignments, of 70/100 to H. E. Moyses, New York, N. Y., and 30/100 to A. J. Warsaw, Grand Rapids, Mich.
1,909,482. **Coating Machine.** C. E. Barrett, assignor to Alexander Smith & Sons Carpet Co., both of Yonkers, N. Y.
1,909,512. **Rubber Article Apparatus.** A. O. Abbott, Jr., Grosse Pointe Park, Mich., assignor to Revere Rubber Co., Providence, R. I.
1,909,574. **Vulcanizing Press.** B. De Mattia, Passaic, N. J.
1,909,653. **Brake Lining Calender.** C. P. Brockway, Ridgewood, assignor to World Bestos Corp., Paterson, both in N. J.
1,910,128. **Airbag.** C. M. Semler, Cuyahoga Falls, O.
1,910,261. **Tubing Machine Strainer Head.** V. Royle, Paterson, N. J.
1,910,277. **Cleaning Vulcanizing Molds.** F. K. Bezzenberger, Cleveland, O.
1,910,323. **Wire Reenforcing Element Apparatus.** G. R. Cunnington, assignor, by mesne assignments, to General Tire & Rubber Co., both of Akron, O.
1,910,858. **Sole Presser.** R. Ruhr, Offenbach a.M., assignor to the Firm Maschinenfabrik Moenus A. G., Frankfurt a.M., both in Germany.
1,911,006. **Testing Machine Resetting Mechanism.** F. A. Valentine, Apponaug, assignor to Henry L. Scott Co., Providence, both in R. I.
1,911,185. **Endless Belt Machine.** C. C. Gates, Denver, Colo.
1,911,497. **Wrapped Belt Vulcanizer.** A. L. Freedlander, Dayton, O.
1,911,594. **Tire Building Drum.** W. E. Swern, Kokomo, Ind., assignor, by mesne assignments, to P. A. Frank, Akron, O.
1,911,682. **Inner Tube Splicer.** N. E. Gardiner, Cuyahoga Falls, and G. B. Nichols, Akron, assignors to Firestone Tire & Rubber Co., Akron, all in O.
1,911,720 **Traffic Marker Mold.** W. S. Sherman, Oklahoma City, Okla.
1,911,894. **Internal Repair Vulcanizer.** J. C. Heintz, Lakewood, O.

Dominion of Canada

330,196. **Tube Splicer.** Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ont., assignee of G. B. Nichols, Akron, O., U. S. A.
330,197. **Continuous Rubber Process.** Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ont., assignee of R. D. Wilhelm and E. E. Bevan, co-inventors, both of Southgate, Calif., U. S. A.
330,258. **Shoe Apparatus.** United Shoe Machinery Co. of Canada, Ltd., Montreal, P. Q., assignee of F. D. Kinney, Southbridge, Mass., U. S. A.
330,468. **Tire Spreader.** E. O. Ungar, Napanee, Ont.
330,490. **Slitting Machine.** Cameron Machine Co., New York, N. Y., assignee of R. McC. Johnstone, Short Hills, N. J., both in the U. S. A.
330,491. **Slitting Machine.** Cameron Machine Co., assignee of J. A. Cameron, both of New York, N. Y., U. S. A.
330,521. **Elastic Filament Apparatus.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of W. A. Gibbons, Montclair, N. J.; E. Hazell, New York, N. Y.; and A. W. Keen, Passaic, N. J., co-inventors, all in the U. S. A.
330,522. **Rubber Filament Process.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of W. A. Gibbons, Montclair, N. J., and E. G. Sturdevant, Bristol, R. I., co-inventors, both in the U. S. A.

United Kingdom

386,464. **Goods from Rubber Dispersions.** J. Aumarechal, Boulogne-sur-Seine, and G. Robrieux, Paris, both in France.
387,438. **Tire Mold Casting Device.** Dunlop Rubber Co., Ltd., London, and T. E. Davies and H. Blackmore, both of Birmingham.
387,515. **Collapsible Tire Core.** Firestone Tyre & Rubber Co., Ltd., Middlesex, assignee of H. D. Stevens, Akron, O., U. S. A.
387,529. **Bead Core Machine.** Goodyear Tire & Rubber Co., Akron, O., U. S. A.
387,793. **Guillotine Machine.** Goodyear Tire & Rubber Co., Akron, O., U. S. A.
388,216. **Goods from Aqueous Dispersions.** Revere Rubber Co., Providence, R. I., assignee of W. A. Gibbons, Montclair, N. J.; E. Hazell, New York, N. Y.; and A. W. Keen, Passaic, N. J., all in the U. S. A.

Germany

576,573. **Mixing Mill.** Aksel Robert Winther Norbak, Gentofte, Denmark. Represented by C. G. Pagel, Berlin.
576,733. **Spray Head for Tuber Machine.** Dunlop Rubber Co., Ltd., London, England. Represented by B. Kaiser and E. Salzer, both of Frankfurt, a.M.
577,969. **Device for Making Tire Inserts.** Dunlop Rubber Co., Ltd., London, and Francis Shaw & Co., Ltd., Bradford, both in England. Represented by R. and M. M. Wirth, C. Weihe, and H. Weil, all of Frankfurt a.M., and T. R. Koehnhorn, Berlin.

PROCESS

United States

1,907,492. **Rug.** N. H. Brewster, Brooklyn, N. Y., assignor to Chelsea Fibre Mills, a corp. of N. Y.
1,907,496. **Gas Cell Material.** W. A. Buedinger and S. G. Byam, both of Fairfield, Conn., assignors to E. I. du Pont de Nemours & Co., Wilmington, Del.
1,907,616. **Dispersing Asbestos.** G. R. Tucker, N. Andover, assignor to Dewey & Almy Chemical Co., Cambridge, both in Mass.
1,907,617. **Rubber Bonded Asbestos.** G. R. Tucker, N. Andover, assignor to Dewey & Almy Chemical Co., Cambridge, both in Mass.
1,907,771. **Enamel Ware Designs.** A. E. Fellner, Belleville, Ill.
1,908,498. **Bottle Cap Liner Material.** A. H. Warth, assignor to Crown Cork & Seal Co., Inc., both of Baltimore, Md.
1,908,654. **Rubber Article.** C. L. Beal, Cuyahoga Falls, assignor to American Anode, Inc., Akron, both in O.
1,908,682. **Composite Article.** B. Bronson, assignor to Ohio Rubber Co., both of Cleveland, O.
1,908,719. **Shaped Rubber Article.** E. A. Willson, assignor to American Anode, Inc., both of Akron, O.
1,908,747. **Sponge Rubber.** F. Girg,

assignor to Gummi- & Balatawerke Matador A.G., both of Bratislava-Petrzalka, Czechoslovakia.

1,909,089. **Shoemaking.** H. H. Beckwith, Brookline, assignor to Beckwith Mfg. Co., Boston, both in Mass.

1,909,364. **Coating Porous Articles.** P. Klein, F. Gabor, and L. Kaunitz, all of Budapest, Hungary, assignors to American Anode, Inc., Akron, O.

1,909,455. **Fibrous Product.** W. F. Busse, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,910,073. **Webbing.** F. A. Weidhaas, assignor to United Elastic Corp., both of Easthampton, Mass.

1,910,244. **Aqueous Rubber Dispersion.** C. L. Hauthaway, Newton, Mass.

1,910,547. **Articles from Aqueous Dispersions.** R. G. James and D. F. Twiss, both of Birmingham, England, assignors to American Anode, Inc., Akron, O.

1,910,579. **Goods from Aqueous Dispersions.** D. F. Twiss, Birmingham, England, assignor to American Anode, Inc., Akron, O.

1,910,580. **Coating Permeable Material.** D. F. Twiss and R. G. James, both of Birmingham, England, assignors to American Anode, Inc., Akron, O.

1,910,764. **Artificial Denture.** J. L. Halley, San Francisco, Calif.

1,911,176. **Coloring Flexible Articles.** N. Barr and R. J. Dorn, assignors to Barr Rubber Products Co., all of Sandusky, O.

1,911,532. **Endless V-Belt.** R. Roderwald, Berlin, Germany, assignor to Dayton Roderwald Co., Dayton, O.

1,911,566. **Hard Rubber Article.** I. Q. Gurnee, Butler, N. J.

1,911,765. **Stencil Sheet.** J. H. Matthews, Pittsburgh, Pa., and L. M. Harley, Brooklyn, N. Y., assignors to Jas. H. Matthews & Co., a corp. of Pa.

1,911,841. **Shoe Stiffener.** H. S. Miller, Quincy, assignor to Beckwith Mfg. Co., Boston, both in Mass.

Dominion of Canada

330,198. **Colored Rubber Product.** Flintkote Corp., assignee of Flintkote Co., both of Boston, Mass., U. S. A., assignee of F. C. Van Heurn, Amsterdam, Holland.

330,478. **Hard Rubber-Lined Receptacle.** American Hard Rubber Co., New York, N. Y., assignee of E. S. Boyer, Plainfield, N. J., both in the U. S. A.

United Kingdom

387,084. **Golf Ball Core.** Dunlop Rubber Co., Ltd., London, and D. F. Twiss and A. E. T. Neale, both of Birmingham.

387,125. **Coated Fabric.** Johnson & Johnson (Gt. Britain), Ltd., Slough. (Johnson & Johnson, New Brunswick, N. J., U. S. A.)

387,306. **Utilizing Waste Rubber.** R. Botson and J. Kamp, both of Auderghem, Belgium.

387,414. **Artificial Leather.** E. Gartner and M. Ruch, both of Berlin, Germany.

387,451. **Coated Fabric.** Dunlop Rubber Co., Ltd., London, and L. Brown and F. W. Warren, both of Manchester.

387,670. **Surgeons' Glove.** Dunlop Rubber Co., Ltd., London; Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands; and D. F. Twiss and E. A. Murphy, Birmingham.

387,671. **Ornamenting Rubber.** Dunlop Rubber Co., Ltd., London; Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands; and D. F. Twiss, E. A. Murphy, and A. Niven, all of Birmingham.

Germany

576,732. **Decorating Rubber Objects.** Dunlop Rubber Co., Ltd., London, England, and the Anode Rubber Co., Ltd., St. Peter's Port, Channel Isles. Represented by W. Karsten and C. Wiegand, both of Berlin.

577,732. **Objects from Mixing Natural Rubber and Polymerization Products.** I. G. Farbenindustrie A.G., Frankfurt a.M.

577,802. **Covering Hard Objects.** Dunlop Rubber Co., Ltd., London, England. Represented by W. Karsten and C. Wiegand, both of Berlin.

577,803. **Covers for Metallic Surfaces.** Vereinigte Stahlwerke A.G., Dusseldorf.

CHEMICAL

United States

1,907,545. **Accelerator.** L. H. Howland, Nutley, N. J., assignor to Naugatuck Chemical Co., Naugatuck, Conn.

1,907,634. **Latex-Treated Asbestos.** W. B. Wescott, Boston, assignor to Dewey & Almy Chemical Co., Cambridge, both in Mass.

1,908,065. **Accelerator.** W. Scott, Nitro, W. Va., assignor to Rubber Service Laboratories Co., Akron, O.

1,908,093. **Age Resister.** I. Williams, Lakewood, O., assignor, by mesne assignments, to E. I. du Pont de Nemours & Co., Wilmington, Del.

1,908,482. **Rubber Composition.** H. Klein and A. Beck, both of Mannheim, assignors to I. G. Farbenindustrie A.G., Frankfurt a.M., all in Germany.

1,908,485. **Plastic Product.** J. V. Meigs, Hastings upon Hudson, assignor to Sweets Laboratories, Inc., New York, both in N. Y.

1,909,080. **Lubricating and Cooling Substance.** C. B. Strauch, McGregor, Minn.

1,909,219. **Caoutchouc Solutions.** R. Oeckinghaus, assignor to Immalin-Werke Chemische Fabrik Eisendrath G. m. b. H., both of Mettmann, Germany.

1,909,329. **Age Resister.** G. R. Yohe, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,910,005. **Factice.** A. De Waele, assignor to D. Gestetner, Ltd., both of London, England.

1,910,718. **Rubber and Gutta Percha Cleaner.** O. H. Strecker, Darmstadt, Germany.

1,910,816. **Accelerator.** R. L. Sibley, Nitro, W. Va., assignor to Rubber Service Laboratories Co., Akron, O.

1,910,846. **Synthetic Rubber.** A. T. Maximoff, New York, N. Y., assignor to Naugatuck Chemical Co., Naugatuck, Conn.

1,910,847. **Rubber Dispersion.** A. T. Maximoff, Vercelli, Italy, assignor to Naugatuck Chemical Co., Naugatuck, Conn.

1,911,092. **Age Resister.** W. Scott, assignor to Rubber Service Laboratories Co., both of Akron, O.

1,911,139. **Rubber Substitute Composition.** A. C. Fischer, Chicago, Ill., assignor to Philip Carey Mfg. Co., a corp. of O.

1,911,263. **Accelerator.** A. Cambron, Montreal, P. Q., Canada, assignor, by mesne assignments, to Roessler & Hasslacher Chemical Co., a corp. of Del.

1,911,631. **Flooring Composition.** H. L. Levin, Nutley, N. J., assignor to Flintkote Corp., Boston, Mass.

1,911,672. **Artificial Rubber.** W. Bock and E. Tschunkur, both of Cologne-Mulheim, assignors to I. G. Farbenindustrie A.G., Frankfurt a.M., all in Germany.

1,911,729. **Tire Composition.** E. Tschunkur and W. Bock, both of Cologne-Mulheim, assignors to I. G. Farbenindustrie A.G., Frankfurt a.M., all in Germany.

Dominion of Canada

330,287. **Factice.** M. Bandli, London, England.

United Kingdom

386,628. **Factice.** J. T. Giron, San Francisco, Calif., U. S. A.

386,846. **Rubber Composition.** L. Gaisman, Woodley.

387,136. **Leather Substitute.** L. Boudy, Paris, France.

387,267. **Rubber Composition.** Soc. Italiana Pirelli, Milan, Italy.

387,454. **Accelerator.** Naugatuck Chemical Co., Naugatuck, Conn., assignee of W. F. Tuley, Nutley, N. J., both in the U. S. A.

387,686. **Rubber Lacquer.** H. Dreyfus, London.

387,744. **Insulating Composition.** International General Electric Co., Inc., New York, N. Y., U. S. A., assignee of Allgemeine Elektricitäts-Ges., Berlin, Germany.

387,811. **Rubber Composition.** Vulcan Proofing Co., Brooklyn, N. Y., U. S. A.

387,924. **Accelerator.** Deutsche Hydrierwerke A.G., Anhalt, Germany.

387,934. **Accelerator.** G. P. Davis, Singapore, Straits Settlements.

388,022. **Fibrous Plastic Composition.** G. W. Beldam, Surrey.

388,031. **Rubber Composition.** E. Nottebohm and Herold A.G., assignee of H. Roth, all of Hamburg, Germany.

388,287. **Rubber Cating Composition.** A. Kampfer, Paris, France, and A. C. Plötze, Berlin, Germany.

388,340. **Rubber Composition.** G. E. Heyl, London.

388,341. **Latex.** M. J. Stam, The Hague, Netherlands.

388,394. **Rubber Composition.** G. Foges, Prague, Czechoslovakia.

388,432. **Accelerator.** Rubber Service Laboratories Co., Akron, O., assignee of R. L. Sibley, Nitro, W. Va., both in the U. S. A.

388,605. **Porous Rubber Composition.** R. H. Koppel, Rhineland, Germany.

388,746. **Rubber Coating Composition.** E. I. du Pont de Nemours & Co., Wilmington, Del., U. S. A.

Germany

576,141. **Polymerization of Unsaturated Combinations.** R. Pummerer and H. Kehlen, both of Erlangen.

577,374. **Antiager.** B. F. Goodrich Co., New York, N. Y., U. S. A. Rep-

resented by G. Benjamin, Berlin-Charlottenburg.

577,433. **Dehydrating Objects from Concentrated Aqueous Dispersions.** Anode Rubber Co. (England), Ltd., London, England. Represented by W. Karsten and C. Wiegand, both of Berlin.

577,731. **Producing Rubberlike Masses.** I. G. Farbenindustrie A.G., Frankfurt a.M.

GENERAL

United States

1,907,502 and 1,907,503. **Freezing Tray.** R. H. Chilton, assignor to Inland Mfg. Co., both of Dayton, O.

1,907,612. **Shoe.** I. Tarlow, Brockton, Mass.

1,907,629. **Lace Fastener.** A. R. Walty, Albany, N. Y.

1,907,689. **Running Board Mat.** W. S. Vrooman, assignor to Paine & Williams Co., both of Cleveland, O.

1,907,856. **Footwear.** E. A. Murphy, assignor to Dunlop Rubber Co., Ltd., both of Birmingham, England.

1,908,017. **Soap Holder.** H. C. Hebig, assignor to E. Q. Moses, as trustee, both of New York, N. Y.

1,908,038. **Belt.** C. S. Mackenzie, Bound Brook, N. J.

1,908,244. **Inner Tube.** A. O. Herron, Waterbury, Conn.

1,908,399. **Polishing Device.** B. H. Boland, Port Edwards, and H. Lind, Wisconsin Rapids, both in Wis.

1,908,425. **Liner.** R. R. Hunt, assignor to Mishawaka Rubber & Woolen Mfg. Co., both of Mishawaka, Ind.

1,908,433. **Sandal.** H. P. Manville, New Haven, assignor to Goodyear's India Rubber Glove Mfg. Co., Naugatuck, both in Conn.

1,908,537. **Fish Bait.** C. T. Pflueger, assignor to Enterprise Mfg. Co., both of Akron, O.

1,908,557. **Spare Tire Carrier.** O. C. Ritz Woller, Chicago, Ill.

1,908,579. **Yielding Supporting Means.** J. W. Vedder, Worcester, Mass.

1,908,643. **Channel Felt.** H. De B. Rice, Bristol, R. I., assignor, by mesne assignments, to New York Belting & Packing Co., New York, N. Y.

1,908,669. **Face Lift.** N. H. Horne, Kansas City, Mo.

1,908,695. **Drive Roll.** F. Deutsch, Memphis, Tenn., assignor, by mesne assignments, to Sparta Foundry Co., Sparta, Mich.

1,908,725. **Elastic Fabric.** M. Baumgärtel, assignor to Julius Rompler A.G., both of Zeulenroda, Germany.

1,908,730. **Dustpan.** J. R. and M. L. Caldwell, both of Norton, Mass.

1,908,776. **Steering Mechanism.** P. E. Matthews, Plainfield, N. J., assignor to International Motor Co., New York, N. Y.

1,908,839. **Door Bumper.** J. W. Greig, Grosse Pointe Park, assignor to Hudson Motor Car Co., Detroit, both in Mich.

1,908,863 and 1,908,864. **Glass Run Channel.** J. S. Reid, Shaker Heights, assignor to Reid Products Co., Cleveland, both in O.

1,908,886. **Potassium Ferrocyanide Oxidizing Apparatus.** R. Brandt, Bergedorf, Germany.

1,908,962. **Electrolytic Condenser.** H. I. Danziger, New York, N. Y., assignor to Condenser Corp. of America, Jersey City, N. J.

1,908,982. **Elastic Webbing Sealed Package.** A. S. Howard, S. Attleboro, assignor to Everlastik, Inc., Chelsea, both in Mass.

1,908,988. **Tray.** F. S. Lack, Paducah, Ky., assignor, by mesne assignments, to Tray Service Co., Dallas, Tex.

1,909,010. **Vibration Insulator.** A. L. Riker, Jr., Fairfield, assignor to Rubber Shock Insulator Corp., Bridgeport, both in Conn.

1,909,096. **Applicator.** F. B. Cooney, assignor to American Crayon Co., both of Sandusky, O.

1,909,100. **Oscillating Joint.** H. D. Geyer, assignor to Inland Mfg. Co., both of Dayton, O.

1,909,273. **Brassière and Step-in.** M. C. Hennessy, assignor to Franklin Simon & Co., Inc., both of New York, N. Y.

1,909,534. **Packing.** C. C. Hull, assignor to Durametallic Corp., both of Kalamazoo, Mich.

1,909,620. **Ladder Gripping Device.** H. W. Lang, Lebanon, N. H.

1,909,746. **Rubber Coated Article.** H. Beckmann, Berlin-Zehlendorf, Germany.

1,909,802. **Toilet Article.** W. L. Bass, New York, N. Y.

1,909,878. **Tire.** J. V. Martin, Garden City, N. Y.

1,909,892. **Fabric Reenforced Article.** D. K. Pope, Cleveland, O.

1,909,921. **Inflatable Article Valve.** E. E. Tompkins, Ardmore, Pa.

1,909,927. **Rubber Band Rifle.** P. W. Beauchamp and G. Beckam, assignors of ¼ to H. C. Schroeder, all of Oakland, Calif.

1,909,966. **Sponge Applicator.** W. B. Jones, Chicago, Ill.

1,910,609. **Pneumatic Cushion Heel Pad.** J. C. Keller, assignor to Keiler Pneumatic Footwear Co., both of Chicago, Ill.

1,910,758. **Filter Media.** M. W. Dundore, assignor to Beloit Iron Works, both of Beloit, Wis.

1,910,901. **Garment Hanger.** L. H. Koplow, Boston, Mass.

1,910,907. **Fountain Pen.** A. Schlosser, Brooklyn, N. Y.

1,910,930. **Ball Compression Container.** W. E. Morris, Baltimore, Md.

1,910,970. **Nipple.** S. Schenkel, Brooklyn, N. Y.

1,911,001. **Creping Machine.** H. A. Sheesley, Portland, Me., assignor to Continental Paper & Bag Corp., New York, N. Y.

1,911,010. **Supporting Foot.** C. W. Brawley, Brooklyn, N. Y.

1,911,125. **Pressure Ball Container.** G. Miller, New Haven, Conn.

1,911,227. **Bathing Suit.** J. J. Galligan and W. J. Robinson, assignors to Revere Rubber Co., all of Providence, R. I.

1,911,244. **Traction Increasing Device.** A. Rozwora, New Milford, Conn.

1,911,314. **Battery Box Handle.** P. G. E. Gunkel, assignor to Jos. Stokes Rubber Co., both of Trenton, N. J.

1,911,330 and 1,911,331. **Absorption Shim for Trucks.** T. H. Symington, assignor to T. H. Symington & Son, Inc., both of Baltimore, Md.

1,911,366. **Air Supply Controller.** W. H. Kitto, Canton, and R. G. Roshong, N. Canton, both in O., assignors to Hoover Co., a corp. of O.

1,911,434. **Dandy-Roll Driver.** W. B. Clements, assignor to Bryant Paper Co., both of Kalamazoo, Mich.

1,911,496. **Belt.** A. L. Freedlander, Dayton, O.

1,911,500. **Fruit Packer's Glove.** A. L. Gowdy and R. L. Eastman, both of Anaheim, Calif.; said Gowdy assignor to said Eastman.

1,911,524. **Elastic Vehicle Wheel.** V. H. Nalinne, Brussels, Belgium.

1,911,531. **Driving Mechanism.** R. Roderwald, Berlin, Germany, assignor to Dayton Roderwald Co., Dayton, O.

1,911,534. **Treating Kaoliang.** E. Satake, Osaka, Japan.

1,911,570. **Hose Nipple.** W. Holstein, Beacon, assignor to New York Rubber Corp., New York, both in N. Y.

1,911,585. **Resilient Support.** C. Saurer, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,911,641. **Tire Deflation Switch.** G. W. Morris, Des Moines, Iowa.

1,911,649. **Upholstery Finishing Strip.** C. P. Schlegel, assignor to Schlegel Mfg. Co., both of Rochester, N. Y.

1,911,675. **Arch Supporting Heel.** C. Carpentieri, New Haven, Conn.

1,911,817. **Sunshade.** M. C. Du Bois, San Francisco, Calif.

1,911,866. **Bearing Bush.** H. N. Wylie, Twickenham, England.

1,912,066. **Refrigerating Apparatus.** F. L. Chase and S. V. Cook, assignors to Frigidaire Corp., all of Dayton, O.

1,912,224. **Sealed Soap Holder.** A. Schimel, New York, N. Y.

1,912,237. **Washing Machine.** H. Zemke, Berlin, Germany.

1,912,272. **Graphite Anode.** G. G. Gomez, Johnsonburg, Pa.

1,912,312. **Sink Stopple.** W. F. Schacht, Huntington, Ind.

Dominion of Canada

330,103. **Nipple.** I. Barkan, Philadelphia, Pa., U. S. A.

330,226. **Heel.** Panther Rubber Co., Ltd., Sherbrooke, P. Q., assignee of F. Berenstein, Chelsea, Mass., U. S. A.

330,263. **Shoe Bottom Filler.** United Shoe Machinery Co. of Canada, Ltd., Montreal, P. Q., assignee of H. Barnett, Leicester, England.

330,285. **Tire Pressure Regulator.** A. Monro, R. T. Wawn, both of Sydney, and M. Anderson, Randwick, co-inventors, all in N. S. W., Australia.

330,306. **Vibration Damper.** H. C. Lord, Erie, Pa., U. S. A.

330,715. **Dishwashing Machine.** Conover Co., Chicago, assignee of W. S. Hilpert, Winnetka, and E. S. Stoddard, Berwyn, co-inventors, all in Ill., U. S. A.

330,813. **Corselette.** I. Rosner, New York, N. Y., assignee of P. J. Moran, Newark, N. J., both in the U. S. A.

United Kingdom

386,054. **Motor-Cycle Saddle Top.** Gough & Co. (Saddles), Ltd., and H. C. Preston, both of Birmingham.

386,334. **Cushion.** E. B. Killen, London.

386,394. **Tire Deflation Indicator.** S. J. E. Davy, London.

386,505. **Thermostat.** Etablissements M. Houdaille, Levallois-Perret, Seine, France.

386,549. **Mudguard Support.** Vauxhall Motors, Ltd., Luton.

386,608. **Boot Electrical Earthing Device.** E. G. Barlow, F. G. Gatensbury, and W. Podmore, all of Stoke-on-Trent.
386,761. **Tiling and Paving.** Braithwaite & Co. Engineers, Ltd., Westminster, and H. B. Hood and J. Hines, both of London.
386,773. **Cistern.** J. Fletcher, Preston.
386,780. **Leg Guard.** Slazengers, Ltd., and A. P. Chadwick, both of London.
386,786. **Wheel.** W. T. Lalonde, Weston-super-Mare.
386,864. **Spring Upholstery Cord.** Staples & Co., Ltd., and C. J. Chislett, both of London.
386,871. **Trouser Waistband.** A Simpson, London.
386,882. **Gramophone Pick-up.** C. Collaro and Collaro, Ltd., both of London.
386,889. **Percussive Drill.** A. Colinet, Houdeng-Goegnies, Belgium.
386,940. **Joint Packing.** M. J. B. Barbarou, Neuilly-sur-Seine, France.
387,044. **Filter.** Oliver United Filters, Inc., San Francisco, Calif., U. S. A.
387,071. **Hair Net.** R. Shaw, Nottingham.
387,094. **Latex-Treated Stocking.** J. B. Lewis & Sons, Ltd., and S. E. Ward, both of Nottingham.
387,219. **Heel.** Bata Akciova Spolecnost, Zlin, Czechoslovakia.
387,223. **Stair Detachable Nosing.** T. Hammerschmidt, Harz, Germany.
387,235. **Glove Putting-On Device.** H. E. and R. W. Breuls, both of Toronto, Canada.
387,260. **Collar Stud.** D. A. Klagsbrunn, Vienna, Austria.
387,271. **Surgical Bandage Package.** H. G. and M. M. Söhngen, both of Wiesbaden, Germany.
387,379. **Loaded Submarine Cable.** Electrical Research Products, Inc., New York, N. Y., U. S. A., and J. J. Gilbert, c/o Norddeutsche Seekabelwerke A.G., Nordeham-on-Weser, Germany.
387,421. **Vehicle Window Guide.** J. S. Reid, Shaker Heights, O., U. S. A.
387,479. **Sand Shoot.** E. J. Byrne, Seaford, and J. P. Ryan, Berak, Federated Malay States.
387,480. **Sliding Clasp Fastener.** J. H. Collins, London.
387,505. **Cable.** C. J. Beaver and N. Dixon, both of Cheshire, and W. T. Glover & Co., Ltd., Manchester.
387,547. **Upholstery Stuffing Material.** F. Wernersson, assignee of K. V. I. Jensen, both of Copenhagen, Denmark.
387,551. **Brush Handle.** H. Petzold, Breslau, Germany.
387,559. **Road Marker.** Braithwaite & Co. Engineers, Ltd., Westminster, and J. Hines, London.
387,576. **Mold Cover.** K. Bratring, Berlin, Germany.
387,626. **Cable Identification Strip.** Liverpool Electric Cable Co., Ltd., and T. H. Tweedle, both of Liverpool.
387,703. **Motion Picture Film.** M. Tanatar, Paris, France.
387,711. **Printing Machine.** G. Fischer, Bielefeld, Germany.
387,729. **Cycle Weather Guard.** H. and J. Jelley, both of Birmingham.
387,739. **Cycle Saddle Top.** H. and J. Jelley, both of Birmingham.
387,750. **Electrically Tripped Switch.** Stotzkontakt Ges., Mannheim, Germany.
387,759. **Battery Cover.** C. Aus Der Au, Zurich, Switzerland.
387,801. **Boot Protector.** H. Assheton, London.
387,805. **Door Stay.** W. E. Hill, Lancashire.
387,872. **Massage.** L. M. McNab, Killara, Australia.
387,914. **Textile Machine Yarn Furnisher.** Scott & Williams, Inc., assignee of H. Swinglehurst, both of New York, N. Y., U. S. A.
387,926. **Stereotype Plate.** Laboratories Sauter Soc. Anon., Geneva, Switzerland.
387,974. **Gramophone Pick-up.** C. Lindström A.G., Berlin, Germany.
388,008. **Oar.** G. A. E. Aviet, S. Kensington, Australia.
388,019. **Light Screening Device.** G. K. and J. M. Harkness, both of Kent.
388,095. **Joint.** L. Thiry, Huy, Belgium.
388,224. **Soap Holder.** H. D. Henry, London.
388,343. **Rack.** R. G. G. Townsend, Croydon.
388,472. **Spring Upholstered Seat.** H. A. Howard, Surrey.
388,482. **Printing Plate.** R. C. Van Houtën, London.
388,846. **Paving.** St. Albans Rubber Co., Ltd., Finsbury Pavement, and G. McPherson and A. Thorp, both of London.
389,172. **Doll's Head.** R. Wernicke, Thuringia, Germany.

Germany

576,041. **Inflatable Toys.** Radium-Gummiwerke m.b.H., Koln-Dellbruck.
577,274. **Artificial Limb Joint.** Desoutter Bros., Ltd., London, England. Represented by B. Kugelmann, Berlin.
577,513. **Cudgel with Spraying Device.** J. Thiecke, Berlin-Pankow.
577,593. **Vehicle Saddle Cover.** Dunlop Rubber Co., Ltd., London, England. Represented by B. Kaiser and E. Salzer, both of Frankfurt a.M.
578,137. **Shaving Brush.** I. Bloch, Frankfurt a.M.

TRADE MARKS

United States

302,302. Labels containing the words: **"Golden, Crown."** Golf balls. Walgreen Co., Chicago, Ill.
302,309. **Yarnlastik.** Yarn. Everlastik, Inc., Chelsea, Mass.
302,343. Monogram of the letter: **"K."** Tires and tubes. Kelly-Springfield Tire Co., New York, N. Y.
302,356. Label containing representation of a crown. Golf balls. Walgreen Co., Chicago, Ill.
302,430. **Amora.** Chemicals for controlling odors of rubber and rubber compounds. Naugatuck Chemical Co., New York, N. Y.
302,472. **Rex-Hide.** Molded friction brake lining. Rex-Hide Rubber Mfg. Co., E. Brady, Pa.
302,504. **Institute of Feminine Hygiene.** Druggists' sundries and hospital supplies. Institute of Feminine Hygiene, Inc., New York, N. Y.
302,590. **Doctor-ette.** Rubber diapers. C. H. Rainey, Malone, N. Y.
302,621. **Di-Mon-Ex.** Composition rubber soles. O. Brockman, Louisville, Ky.
302,631. **Chums.** Rubber gloves. Massillon Rubber Co., Massillon, O.
302,755. **Okay.** Combs. American Hard Rubber Co., Hempstead, N. Y.
302,763. **Bondogen.** Compounding ingredient. R. J. King Co., Inc., Stamford, Conn.
302,766. **Plastogen.** Compounding ingredient. R. J. King Co., Inc., Stamford, Conn.
302,787. Representation of a panther and the words: **"Panther Tread."** Heels. Panther Rubber Mfg. Co., Stoughton, Mass.
302,814. **Hi-Test.** Heels and soles. L. Karno & Co., Inc., Chicago, Ill.
302,815. **Trim-Arch.** Footwear. United States Rubber Co., New York, N. Y.
302,921. Representation of a cat and a fence and the words: **"Dr. Scat! Refinisher."** Liquid for refinishing and resurfacing rubber rolls. Dr. Scat Chemical Co., Chicago, Ill.
302,945. The word: **"Magnex"** in white on a black background. Spark plugs, batteries, etc. Firestone Battery Co., Akron, O.
302,972. Representation of a length of insulated wire formed into the word: **"kantkink."** Self-folding and coiling electric conductors. United Elastic Corp., Easthampton, Mass.
302,982. **Fastcure.** Vulcanizing cement. Kelly-Springfield Tire Co., New York, N. Y.
302,984. **Fastcure.** Tire repair patches, tread stock, and cushion gum. Kelly-Springfield Tire Co., New York, N. Y.
302,986. **Airytread.** Floor coverings and rug cushions. Allen Industries, Inc., Detroit, Mich.
302,988. **Altex.** Floor coverings and rug cushions. Allen Industries, Inc., Detroit, Mich.
302,989. Triangle containing fanciful design and the word: **"Allen."** Floor coverings and rug cushions. Allen Industries, Inc., Detroit, Mich.
303,063. **Snug-Ette.** Sanitary belts. Everlastik, Inc., Chelsea, Mass.
303,122. **Bonalite.** Toilet seat. American Rubber Products Co., Detroit, Mich.
303,151. Letter: **"A."** Rubber liners for milking machine teat cups. De Laval Separator Co., New York, N. Y.
303,175. **Dirtoway.** Cleaning compound for rubber, etc. Blesant Laboratories, Inc., New York, N. Y.
303,252. **Spec Black.** Carbon black. J. M. Huber, Inc., New York, N. Y.
303,278. **Non - Destructible Brand.** Rubber sheeting. Holstein Rubber Products Co., Inc., Hartford, Conn.
303,295. Representation of a patched, inflated inner tube and a deflated inner tube together with representation of a tire repair patch container, and the words: **"America's Best Patch."** Tire repair patches. J. R. Benson, doing business as J. R. Benson Rubber Co., East St. Louis, Ill.
303,308. **Champion.** Jar rings and rubbers. Schacht Rubber Mfg. Co., Huntington, Ind.
303,330. Letter: **"L"** above and below the word: **"Penfold."** Golf balls. John P. Stockbridge, Inc., now by change of name Penfold Golf Balls, Inc., New York, N. Y.
303,353. **Lullaby.** Nursing nipples. Pyramid Rubber Co., Ravenna, O.

Market Reviews

CRUDE RUBBER

RUBBER prices fluctuated widely on both sides of the market in the past month. Speculators, of course, intensified the extent of the changes since the market was vulnerable to outside news and to the course of other commodity prices.

Early in the month rubber participated in a general advance which followed formal announcement of abandonment of the gold standard. Then an unfounded report that restriction negotiations had been called off, together with the anticipation that stabilizations of the dollar would result from the London Economic Conference, culminated in losses of over 1¢ a pound.

Denial of the restriction rumor and reports of further meetings between Dutch and British growers helped the market to recover some of its lost ground, and the firm stand of the administration against stabilization at the conference put quotations on the plus side for the month up to June 24.

Restriction negotiations have been long-drawn out, but no one has given up hope. The high Malayan shipments as well as heavy production in Ceylon and other quarters induced by better prices, the opening of new rubber areas now coming into production, all point to the need of an agreement. The stalemated Economic Conference also puts a premium on private initiative.

Automobile production and sales figures lend encouragement to the economic picture. Increases of 20 and 30% for May and June over a year ago, with the peak in sales still ahead, have factories running at fine rates of production. Tire sales are improving strongly, and it looks as if the latent replacement demand is being drawn out. The rise in prices and wages augurs well for this industry.

Stocks are high, and production of rubber is heavy. But with 44,580 tons consumed in May, and the same or better expected for June, and the chance that restriction will go through, one is led to believe that the bear points won't be bearish long.

Factory interest waxed and waned with the market during the month. Buyers of actuals made good purchases on the rise, but refrained from the market on the declines. Factories of all kinds are expanding, and in many of the small and medium sized ones their inventories of raw rubber are far from excessive. When one considers that the dull season for the large industries like tires and automobiles is approaching, the showing thus far is very encouraging.

RUBBER BULL POINTS

1. May consumption of crude rubber in the United States was 44,580 tons against 26,226 for April this year and 30,957 tons in May, 1932.
2. May imports of rubber in the United States were 14.5% under May, 1932.
3. May production of automobiles was 21% ahead of April and 20% over May, 1932. June production is estimated to be the same or better.
4. Tire prices were increased for the second rise in 5 weeks.
5. Wages of employes of tire manufacturers were raised 5 to 10%, reflecting increased sales and prices.
6. June automobile sales are put at 30% above June a year ago.
7. April shipments of pneumatic casings were 74.7% higher than March, but 1.2% under April, 1932; production was 53.5% higher than March and 11.2% under April, 1932.
8. Pneumatic casings on hand April 30 were 7.1% under March 31 and 31.2% under April 30, 1932.
9. First quarter exports of automobiles was 21% higher than those in the same time last season.
10. Restriction negotiations still go on, with hopes of governmental action growing stronger.

RUBBER BEAR POINTS

1. United States rubber consumption for the first 5 months of 1933 was 133,398 tons against 149,449 in the same 1932 period.
2. May stocks decreased 4.6% under April, but were still 8.2% above those of May 31, 1932.
3. Crude rubber afloat for the United States on May 31 was 43,342 tons against 30,745 on April 30 and 50,453 on May 31, 1932.
4. Malay shipments for June are expected to be 44,000 tons against 42,000 in May and 36,500 in June, 1932.
5. Malayan dealers' stocks were 33,383 tons on May 31 against 30,203 on April 30 and a revised figure of 23,673 in May, 1932.
6. Malay exports for the 5 months were 205,876 tons against 201,516 in the same period a year ago; Ceylon shipped 24,124 tons against 19,616.
7. Higher prices are increasing production by natives and estates.

Week ended June 3. The formal elimination of the gold clause in all United States contracts gave impetus to the market last week which has been carried over into the present market. This, added to the hope for definite developments on restriction, increased rubber prices from 66 to 74 points for the week. Trading assumed record proportions. On Wednesday, after the holiday, the market opened with March at 7.90¢, 129 points above Monday's close. It dropped to 6.95 in the first hour, but closed at 7.07¢. Trading volume for the day was 8,970 long tons, the most active day for the month. On the other days of the week the amount of rubber which changed hands was uniformly more than 7,000 tons.

The July contract sold at 6.40¢ at the close, compared with 5.66¢ the week before; September 6.62 against 5.98; October 6.78 against 6.02; December 6.90 against 6.12; January 6.91 against 6.22; March 7.12 against 6.38; and April 7.22 against 6.48.

The gain in prices would have been greater, but Washington stated that the advance in commodities was too rapid. It was felt that the plans the administration had in mind might be upset by the rapid gains, and there were rumors that some regulation of exchanges might be instituted to guarantee a more orderly situation. Naturally this news softened the market over the week-end.

Automobile production has at last turned downward as is usual at this season of the year, but retail demand is such that producers expect the June rate of output to be close to that of May. May sales are expected to run about 20% above those of April and about 18% over those of May last year.

Buying was good in the Outside Market, and prices advanced sharply. Restriction news and estimates of large May takings helped sentiment, although it was dampened somewhat by Washington advices saying the advance was too rapid.

June sold at 6⅝¢, compared with 5-11/16¢ the week before; July-September 6⅞ against 5⅞; October-December 7⅛ against 6¼; and January-March 7½ against 6-7/16.

Week ended June 10. A second rise of tire prices in a month was greeted by a loss in prices on the Rubber Exchange this week. The news had been discounted in advance. The Liverpool market was closed on account of a holiday for the first part of the week, and Wall Street influences provided selling pressure that mounted to losses of about 25 points. These were later recovered as the market rallied with other commodities, and quotations at the close were from 3 to 14 points above last week's.

July closed at 6.47¢, compared with 6.40¢ last Saturday; September 6.73 against 6.62; October 6.81 against 6.78; December 6.95 against 6.90; January 7.05 against 6.91; and March 7.23 against 7.12.

Automobile manufacturers are reporting gains too, with estimates of this year's output now raised to about 1,800,000 units. General Motors reported May sales 20% greater than in April and 35% over those in May, 1932, to domestic consumers. This advance is the greatest over a previous year's total since December, 1929. The showing is good, but does not yet approach even the declining years of 1930 and 1931.

The holiday last week reduced auto-

mobile production, with only 2 companies showing increased and 16 less production. May production for the industry is 230,000 units, about 21% above April and 20% above May, 1932. Sales may reach 170,000 units.

Encouragement was taken from the announcement by The Rubber Manufacturers Association, Inc., that Newton D. Baker, former Secretary of War, will act as special counsel to the rubber industry in forming an operating code under the National Industrial Recovery Act.

The Outside Market was slower this week owing to lack of foreign participation, but volume was still good, with prices scoring a small decline. The press is said to be barred from meetings held on restriction; so nothing further was learned. It was said, though, that former opponents of restriction were almost all won over.

June sold at 6½¢, compared with 6⅝; July-September 6⅝ against 6⅞; October-December 6⅞ against 7⅛; and January-March 7⅛ against 7½.

Week ended June 17. Rubber prices lost more than 1¢ in a steady downward trend last week, which was arrested slightly on Saturday. Reports that restriction negotiations were off sent prices down almost half the amount, and weakness in cotton and stocks caused by uncertainty about plans of the administration contributed to the decline. A fine consumption report, the final adjournment of Congress, and a good tire report did no more than ease the extent of the loss.

At the close on Saturday, July sold at 5.38¢, compared with 6.47 the week before; September 5.65 against 6.73; October 5.75 against 6.81; December 5.95 against 6.95; January 6.05 against 7.05; and March 6.24 against 7.23.

A London newspaper carried the story that the Dutch minister said restriction was futile and that the British had given up all ideas of its adoption. Later reports read that the British attitude had not changed in the least—they will not take the initiative, but will only consider a proposal that gives promise of controlling native output. The day after these developments the Dutch Colonial minister announced that prospects for restriction were better than they were a year before despite the difficult native problem.

The consumption report was excellent, showing the highest figures since May, 1929. May, 1933, consumed 44,580 tons of rubber in the United States, compared with 26,226 tons in April, an increase of 70%. Imports were 27,556 tons, 41.6% over April, but 14.5% less than in May, 1932. Domestic stocks on May 31 were 364,459 long tons, 4.6% less than April, but 8.2% above May, 1932, stocks. Rubber afloat for United States ports on May 31 was 43,342 long tons, against 30,745 on April 30 and 50,453 on May 31, 1932.

Shipments of pneumatic casings for April were 74.7% over March, but 1.2% below April, 1932, according to The Rubber Manufacturers Association, Inc. Production increased 53.3% over March, but was 11.2% under April, 1932. Casings on hand decreased 7.1% under March 31 and 31.2% under April 30, 1932.

Automobile output advanced again last week close to the January high level, and June output will be close to May's from all indications. Retail sales are consistently showing advances over last year.

The reported pegging of the dollar as a result of the economic conference induced much selling and weakened trading in the Outside Market. Trading was not very large in actuals during the week, and factories showed little interest. Prices were shaded a good bit.

June ribbed smoked sheets closed at 5⅝ compared with 6½¢ the week before; July-September 5¾ against 6⅝; October-December 6 against 6⅞; and January-March 6¼ against 7⅛.

Week ended June 24. The London Economic Conference played an important part last week toward influencing commodity prices. On Monday, when advances of 52 to 62 points recovered most of the losses of last week, the rise was due to news that stabilization of the dollar would not be supported at this time. The lack of progress at the Conference led to the belief that since no relief could be expected through international agreements, a much more hopeful outlook could be expected from restriction agreements.

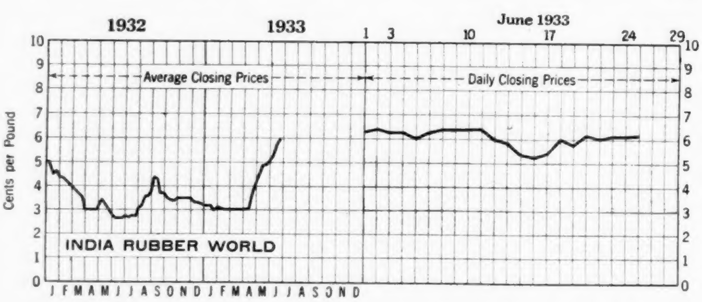
Prices gained from 56 to 63 points for the week, most of it Monday, with speculative interests limiting the fluctuations from then on. July closed at 6¢, compared with 5.38¢ the week before; September 6.28 against 5.65; December 6.56 against 5.95; January 6.64 against 6.05; March 6.80 against 6.24; and May 6.98 against 6.41.

A second meeting of the International Association of Rubber Culture was held in London last week, with "satisfactory progress" reported, as well as "chances of joint action by British, Dutch, French, and Belgian growers" called "very promising." Official government bulletins still deny that any negotiations have been undertaken. The meetings are private and held to draw up a plan to be submitted later to the various governments. At the end of the week no further news had been received about the meeting.

Malayan shipments lent fuel to the bear speculators, the report coming as it did on a day when the dollar advanced. Shipments for June are put at 44,000 tons, compared with 42,000 in May and 36,500 in June, 1932.

Automobile production and sales show very favorable developments. In a season when output normally declines, production figures have reached a new high level for the year. *The New York Times'* index reached 54.1 for the June 17 week, compared with 50.4 in the preceding week and 43.2 for the same week last year. June sales of automobiles are expected to be 30% over those of June, 1932, and the peak is not looked for until much later than it was a year ago.

The code committee of The Rubber



New York Outside Market—Spot Closing Prices Ribbed Smoked Sheets

New York Outside Market—Spot Closing Rubber Prices—Cents per Pound

	May, 1933								
	22	23	24	25	26	27	29	30*	31
Ribbed Smoked Sheet...	4¾	4⅞	5	5	5¼	5⅝	5¾	...	6⅛
No. 1 Thin Latex Crepe.	5½	5⅝	5¾	5¾	6	6⅜	6½	...	6⅞
No. 1 Thick Latex Crepe.	5⅜	5½	5⅝	5⅝	5⅞	6¼	6⅜	...	6¾
No. 1 Brown Crepe.....	3⅞	4	4⅛	4⅛	4⅜	4¾	4⅞	...	5¼
No. 2 Brown Crepe.....	3¾	3⅞	4	4	4¼	4⅝	4¾	...	5⅛
No. 2 Amber..........	3⅞	4	4⅛	4⅛	4⅜	4¾	4⅞	...	5¼
No. 3 Amber..........	3¾	3⅞	4	4	4¼	4⅝	4¾	...	5⅛
No. 4 Amber	3⅝	3¾	3⅞	3⅞	4⅛	4½	4⅝	...	5
Rolled Brown	3⅜	3½	3⅝	3⅝	3⅞	4¼	4⅜	...	4¾

	June, 1933														
	1	2	3	5	6	7	8	9	10	12	13	14	15	16	17
Ribbed Smoked Sheet...	6¼	6⅜	6¼	6¼	6	6¼	6⅜	6⅜	6⅜	6⅜	6	5⅞	5⅜	5¼	5⅜
No. 1 Thin Latex Crepe.	7	7	6⅞	6⅞	6⅝	6⅞	7	7	7	7	6⅝	6½	6	5⅞	6
No. 1 Thick Latex Crepe.	6⅞	6⅞	6¾	6¾	6½	6¾	6⅞	6⅞	6⅞	6⅞	6½	6⅜	5⅞	5¾	5⅞
No. 1 Brown Crepe.....	5⅜	5½	5⅜	5⅜	5⅛	5⅜	5½	5½	5½	5½	5⅛	5	4½	4⅜	4½
No. 2 Brown Crepe.....	5¼	5⅜	5¼	5¼	5	5¼	5⅜	5⅜	5⅜	5⅜	5	4⅞	4⅜	4¼	4⅜
No. 2 Amber..........	5⅜	5½	5⅜	5⅜	5⅛	5⅜	5½	5½	5½	5½	5⅛	5	4½	4⅜	4½
No. 3 Amber..........	5¼	5⅜	5¼	5¼	5	5¼	5⅜	5⅜	5⅜	5⅜	5	4⅞	4⅜	4¼	4⅜
No. 4 Amber	5⅛	5¼	5⅛	5⅛	4⅞	5⅛	5¼	5¼	5¼	5¼	4⅞	4¾	4¼	4⅛	4¼
Rolled Brown	4⅞	5	4⅞	4⅞	4⅝	4⅞	5	5	5	5	4⅝	4½	4	3⅞	4

*Holiday.

Manufacturers Association, Inc., has been in session for the last week in New York, drawing up a code for the industry to be submitted to General Hugh S. Johnson, administrator of the National Industrial Recovery Act. This meeting should further consolidate the industry, following the 5 to 10% increase in wages by rubber companies and the joint action in raising tire prices.

Factory buyers bought a fair volume of rubber on the price rises in the last week, and quotations on the Outside Market showed good gains. Consumption in June is expected to be higher than in May, and the feeling is that favorable action will eventually ensue from the restriction meetings now going on.

June ribbed smoked sheets closed at 6⅛¢, compared with 5⅝¢ last week; July-September 6-5/16 against 5¾; October-December 6-9/16 against 6; and January - March 6-13/16 against 6¼.

Rubber prices received an impetus from the skyrocketing markets of cotton and grain, recording gains of 22 to 29 points to last week's net rise. On June 26 sales were over 5,000 tons; the June contract closed nominally at 6.27¢ against 6¢ on Saturday; July 6.27 against 6.00; August 6.38 against 6.14; September 6.50 against 6.28; December 6.81 against 6.56; March 7.09 against 6.80.

In the open market actuals were 3/16¢ up on standard ribs and 1/16 to ⅛¢ better on other grades. There was considerable factory interest, and the market tone was firm.

New York Quotations

New York outside market rubber quotations in cents per pound

Plantations	June 25, 1932	May 25, 1933	June 26, 1933
Rubber latex... *gal.*	51	42	42
Sheet			
Ribbed, smoked, spot	2 11/16	5 1/16/5⅛	6 /6⅛
Aug.-Sept.	2¾	....	6 3/16/6¼
Oct.-Dec.	2⅞	5½	6 7/16/6⅝
Jan.-Mar.	3 /3 1/16	5¾	6 11/16/6¾
Crepe			
No. 1 thin latex, spot	3⅝/3 11/16	5⅞	6¾/6⅞
Aug.-Sept.	3 11/16/3¾	....	6 13/16/7
Oct.-Dec.	3 13/16/3⅞	6 /6¼	7 3/16/7¼
Jan.-Mar.	4	6½	7 7/16/7½
No. 3 Amber, spot.	2½/2 9/16	4 1/16/4⅛	4 15/16/5
No. 1 Brown	2 9/16/2⅝	3 15/16/4	5 /5⅛
Brown, rolled	2¼/2⅜	3¾	4½/4 9/16
Paras			
Upriver fine	6	7⅞	8¾
Upriver fine	*9¼	*10⅝	*11½
Upriver coarse	†2¾	....	....
Upriver coarse	*4¾	*7	*7¼
Islands fine	†5¾	7¾	8½
Islands fine	*9	*10¼	*11½
Acre, Bolivian fine.	6⅛	8⅛	9
Acre, Bolivian fine.	*9½	*10¾	*11¾
Beni. Bolivian	6⅛	8¼	9¼
Madeira fine	6	7⅞	9
Pontianak			
Bandjermasin	5	5½	6
Pressed block	7	8¼	10
Sarawak	5	5½	6
Caucho			
Upper ball	†2¾	....	....
Upper ball	*4¾	*7	*7
Lower ball	†2½	....	....
Manicobas			
Manicoba, 30% guar.	†2	†3¾	†5
Mangabiera, thin sheet	..	....	....
Guayule			
Duro, washed and dried	12	12	12
Ampar	13	13	13
Africans			
Rio Nuñez	8½	10	10
Black Kassai	8¼	9¾	9¾
Manihot cuttings...	6	4¼	4¼
Prime Niger flake.	12	16⅛	16⅛
Gutta Percha			
Gutta Siak	7	8½	10½
Gutta Soh	15	12	13
Red Macassar	1.50	1.50	1.75
Balata			
Block, Ciudad Bolivar	16	25	27
Manaos block	16	25	28
Surinam sheets ...	32	32	35
Amber	35	35	39

*Washed and dried crepe. Shipments from Brazil. †Nominal.

Rubber Goods Production Statistics

	1933 Jan.	1933 Feb.	1933 Mar.	1932 Mar.
TIRES AND TUBES				
Pneumatic casings				
Production .... *thousands*	1,806	1,871	1,630	2,937
Shipments, total .... *thousands*	2,077	1,834	1,674	2,363
Domestic .... *thousands*	2,011	1,764	1,616	2,281
Stocks, end of month........ *thousands*	5,789	5,902	5,832	7,902
Solid and cushion tires				
Production .... *thousands*	6	7	7	9
Shipments, total .... *thousands*	7	8	7	9
Domestic .... *thousands*	7	7	6	9
Stocks, end of month........ *thousands*	22	21	21	37
Inner tubes				
Production .... *thousands*	1,675	1,779	1,506	2,802
Shipments, total .... *thousands*	2,028	1,682	1,522	2,149
Domestic .... *thousands*	1,989	1,646	1,486	2,094
Stocks, end of month........ *thousands*	4,957	5,085	5,095	7,008
Raw material consumed				
Fabrics .... *thous. of lbs.*	7,899	7,263	6,364	11,292
MISCELLANEOUS PRODUCTS				
Rubber bands, shipments........ *thous. of lbs.*	189	167	162	223
Rubber clothing, calendered				
Orders, net........ *no. of coats and sundries*	11,574	7,327	8,058	13,970
Production .... *no. of coats and sundries*	24,409	16,330	20,997	17,649
Rubber-proofed fabrics, production, total *thous. of yds.*	2,052	2,146	2,303	2,462
Auto fabrics .... *thous. of yds.*	221	243	134	312
Raincoat fabrics .... *thous. of yds.*	[illegible]	616	953	754
Rubber flooring, shipments........ *thous. of sq. ft.*	188	269	307	422
Rubber and canvas footwear				
Production, total .... *thous. of prs.*	3,725	3,275	3,281	3,787
Tennis .... *thous. of prs.*	1,913	2,185	2,634	3,187
Waterproof .... *thous. of prs.*	1,812	1,090	647	600
Shipments, total .... *thous. of prs.*	3,156	3,537	3,390	4,998
Tennis .... *hous. of prs.*	1,814	2,256	2,842	4,264
Waterproof .... *thous. of prs.*	1,342	1,281	548	735
Shipments, domestic, total........ *thous. of prs.*	3,136	3,511	3,339	4,943
Tennis .... *thous. of prs.*	1,801	2,245	2,800	4,216
Waterproof .... *thous. of prs.*	1,335	1,267	539	727
Stocks, total, end of month........ *thous. of prs.*	15,351	15,088	14,965	19,347
Tennis .... *thous. of prs.*	7,008	6,937	6,730	8,191
Waterproof .... *thous. of prs.*	8,343	8,151	8,235	11,156
Rubber heels				
Production .... *thous. of prs.*	13,142	13,030	11,222	16,368
Shipments, total .... *thous. of prs.*	11,336	10,888	10,761	13,514
Export .... *thous. of prs.*	209	221	170	305
Repair trade .... *thous. of prs.*	2,433	2,909	2,677	3,785
Shoe manufacturers .... *thous. of prs.*	8,694	7,758	7,914	9,424
Stocks, end of month........ *thous. of prs.*	21,808	25,267	25,549	27,933
Rubber soles				
Production .... *thous. of prs.*	4,247	4,008	3,959	3,953
Shipments, total .... *thous. of prs.*	3,777	3,728	3,925	3,573
Export .... *thous. of prs.*	1	3	235	2
Repair trade .... *thous. of prs.*	275	362	271	252
Shoe manufacturers .... *thous. of prs.*	3,502	3,362	3,419	3,320
Stocks, end of month........ *thous. of prs.*	2,766	3,121	3,302	2,691
Mechanical rubber goods, shipments				
Total .... *thous. of dollars*	2,060	1,815	2,018	2,638
Belting .... *thous. of dollars*	382	352	358	491
Hose .... *thous. of dollars*	730	633	802	1,174
Other .... *thous. of dollars*	949	830	858	973

Source: *Survey of Current Business*, Bureau of Foreign & Domestic Commerce, Washington, D. C.

New York Outside Market (Continued)

	June, 1933 19	20	21	22	23	24
Ribbed Smoked Sheet	6	5¾	6⅛	6	6⅛	6⅛
No. 1 Thin Latex Crepe	6⅝	6⅝	7	6⅞	7	7
No. 1 Thick Latex Crepe	6½	6½	6⅞	6¾	6⅞	6⅞
No. 1 Brown Crepe	5⅛	4⅞	5⅛	5	5⅛	5½
No. 2 Brown Crepe	5	4¾	5	4⅞	5	5
No. 2 Amber	5⅛	4⅞	5⅛	5	5⅛	5⅛
No. 3 Amber	5	4¾	5	4⅞	5	5
No. 4 Amber	4⅞	4⅝	4⅞	4¾	4⅞	4⅞
Rolled Brown	4⅝	4⅜	4⅝	4½	4⅝	4⅝

Low and High New York Spot Prices

All Prices in Cents per Pound

PLANTATIONS	June 1933*	1932	1931
Thin latex crepe	5⅞/7⅛	3 9/16/3 11/16	6⅜/7½
Smoked sheet, ribbed	5¼/6⅜	2⅝/2¾	6⅛/7
PARAS			
Upriver fine	7½/8½	5½	8⅛/8¾

* Figured to June 26, 1933.

COMPOUNDING INGREDIENTS

BUSINESS in rubber chemicals, colors, and compounding ingredients for the past 2 months has been active because of increased production in tires, mechanical, and other standard rubber goods lines. Shipment instructions on supplies for July delivery indicate continuance of the rapid consumption of ingredients. The increased demand of rubber compounding supplies is roughly indicated by the fact that in May the consumption of crude and reclaim advanced respectively by 70% and 75% over April consumption.

The marked increase in tire production as well as in other rubber products has stimulated a very active demand for rubber chemicals and influenced advances in prices of some compounding ingredients. Carbon black, for example, is moving into consumption at the highest rate since the banner year of 1928. This gain has resulted in decreased stocks; consequently the market is very firm, and there has been talk of an increase in the spot market. Regular users are covered by contracts extending over the present year. The market has a very healthy tone, and the situation is altered decidedly for the better.

Commencing in March there was a steady increase in demand for titanium oxide pigments by the rubber trade, which still continues. Operation of the plants making these pigments is being expanded rapidly to peak production. Prices remain firm, and contracts will not be considered for longer than 6 months in advance.

Zinc oxide is in very active demand by the rubber trade. The price rose from 6¼ to 6½¢ the middle of June.

Lithopone is active, and the demand is increasing. The price is firm. Contracts are being signed for the last half of this year.

The recent advance in the prices of all vegetable oils has resulted in higher prices in the many grades of factice or rubber substitutes. Interest in these products is now more general, and a substantial increase in demand is anticipated.

Rubber solvents are firm at 5¢ per gallon in tank car lots, basis, Group 3 refineries. Both heavy and light grades are in active demand by the rubber trade.

The market for rubber colors is quite firm, and the excessive competitive bidding seems to have slackened. Prices depend on future legislation.

New York Quotations

June 26, 1933

Prices Not Reported Will Be Supplied on Application

Abrasives

Pumicestone, pwd.	lb.	$0.02½/$0.04
Rottenstone, domestic	ton	23.50 /28.00

Accelerators, Inorganic

Lime, hydrated	ton	20.00
Litharge (commercial)	lb.	.07
Magnesia, calcined, heavy	lb.	.04
carbonate	lb.	.06 / .06¼

Accelerators, Organic

Accelerator 49	lb.	
Aldehyde ammonia	lb.	.65 / .70
Altax	lb.	
Barak	lb.	
Butene	lb.	
Captax	lb.	
Crylene	lb.	
paste	lb.	
DBA	lb.	
Di-esterex N.	lb.	
DOTG	lb.	
DPG	lb.	
du Pont 808	lb.	
833	lb.	
Ethylidine aniline	lb.	
Formaldehyde aniline	lb.	.37½/ .40
Heptene	lb.	
base	lb.	
Hexamethylenetetramine	lb.	.37
Lead oleate, No. 999	lb.	.10
Witco	lb.	.11
Lithex	lb.	
Monex	lb.	
Novex	lb.	
Plastone	lb.	
R & H 40	lb.	
50-D	lb.	
Safex	lb.	
Super-sulphur No. 1	lb.	
No. 2	lb.	
Tetrone A	lb.	
Thiocarbanilid	lb.	.20
Thionex	lb.	
Trimene	lb.	
base	lb.	
Triphenyl guanidine	lb.	.58 / .60
Tuads	lb.	
Vulcanex	lb.	
Vulcanol	lb.	
Vulcone	lb.	
ZBX	lb.	
Zimate	lb.	

Acids

Acetic 28% (bbls.)	100 lbs.	2.90 / 3.15
glacial (carboys)	100 lbs.	10.52 /10.77
Sulphuric, 66°	ton	15.50

Age Resisters

Age-Rite Gel	lb.	
powder	lb.	
resin	lb.	
white	lb.	
Albasan	lb.	
Antox	lb.	
BLE	lb.	
Neozone	lb.	
Parazone	lb.	
Permalux	lb.	
VGB	lb.	
Zalba	lb.	

Antiscorch Material

UTB	lb.	

Antisun Materials

Heliozone	lb.	
Sunproof	lb.	

Binders, Fibrous

Cotton flock, dark	lb.	$0.09 /$0.10½
dyed	lb.	.50 / .80
white	lb.	.11½/ .16
Rayon flock, colored	lb.	1.50 / 1.75
white	lb.	1.40

Colors

BLACK		
Bone, powdered	lb.	.05½/ .15
Drop	lb.	.05½/ .17
Lampblack (commercial)	lb.	.10
BLUE		
Prussian	lb.	.35 / .37
Toners	lb.	.80 / 3.50
Ultramarine	lb.	.07 / .10
BROWN		
Mapico	lb.	
Sienna, Italian, raw, pwd.	lb.	.04½/ .11
GREEN		
Chrome, light	lb.	.23 / .25½
medium	lb.	.26 / .27½
oxide	lb.	.19 / .21
Guignet's (bbls.) f.o.b. Easton	lb.	.70
Toners	lb.	.85 / 3.50
ORANGE		
Toners	lb.	.40 / 1.60
ORCHID		
Toners	lb.	1.50 / 2.00
PINK		
Toners	lb.	1.50 / 4.00
PURPLE		
Toners	lb.	.60 / 2.00
RED		
Antimony		
Crimson, R. M. P. No. 3	lb.	.46
Sulphur free	lb.	.48
7-A	lb.	.33
Z-2	lb.	.20
Iron Oxides		
Rub-er-red (bbls.) f.o.b. Easton	lb.	.08¾
Mapico	lb.	
Toners	lb.	.80 / 2.00
WHITE		
Lithopone (bags)	lb.	.04¾
Albalith	lb.	.04½/ .04¾
Cryptone No. 19	lb.	.06 / .06¼
CB No. 21	lb.	.06 / .06¼
Titanium oxide, pure	lb.	.17 / .18¾
Titanox "B"	lb.	.06 / .06½
"C"	lb.	.06 / .06½
Zinc Oxide		
Black label (lead free)	lb.	.05¾
F. P. Florence, green seal	lb.	$0.09⅝/$0.09⅞
red seal	lb.	.08⅝/ .08⅞
white seal (bbls.)	lb.	.10⅞
Green label (lead free)	lb.	.05¾
seal, Anaconda	lb.	.09⅝/ .10⅛
Horsehead (lead free) brand		
Selected	lb.	.05¾/ .06
Special	lb.	.05¾/ .06
XX	lb.	.05¾/ .06
green	lb.	.05¾/ .06
red	lb.	.05¾/ .06
Kadox, black label	lb.	.09⅝/ .09⅞
blue label	lb.	.08⅝/ .08⅞
red label	lb.	.07¼/ .07½
Lehigh (leaded)	lb.	.0490/ .0515
Red label (lead free)	lb.	.05¾
seal, Anaconda	lb.	.08⅝/ .09⅛
Standard (leaded)	lb.	.05½/ .05¾
Sterling (leaded)	lb.	.05½/ .05¾
Superior (leaded)	lb.	.05½/ .05¾
U. S. P. (bbls.)	lb.	.12¾
White seal, Anaconda	lb.	.10⅞/ .11⅞
XX zinc sulphide (bbls.)	lb.	.13
YELLOW		
Chrome	lb.	.15
Mapico	lb.	
Ochre, domestic	lb.	.01⅜/ .02⅝
Toners	lb.	2.50

Factice—See Rubber Substitutes

Fillers, Inert

Asbestine	ton	
Barytes (f.o.b. St. Louis)	ton	23.00
off color	ton	
white	ton	
Blanc fixe, dry, precip	ton	60.00 /65.00
pulp	ton	42.50 /45.00
Infusorial earth	lb.	.03
Kalite No. 1	ton	
No. 3	ton	
Suprex, heavy	ton	45.00 /55.00
white, extra light	ton	60.00 /80.00
Whiting		
Chalk, precipitated	lb.	
Domestic	ton	
Hakuenka	lb.	
Paris white, English cliffstone	100 lbs.	
Sussex	ton	
Witco	ton	20.00

Fillers for Pliability

Flex	lb.	
Fumonex	lb.	
P-33	lb.	
Thermax	lb.	
Velvetex	lb.	

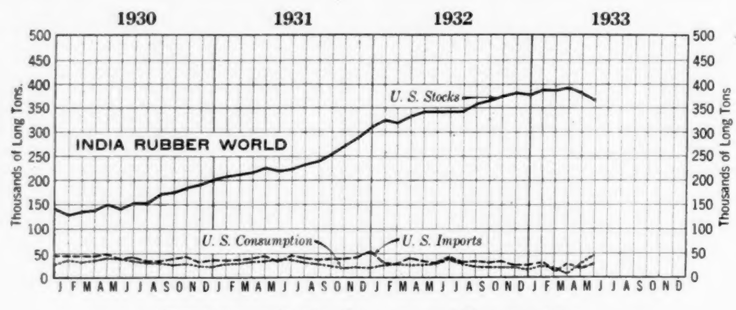
Finishes

IVCO lacquer	gal.	
Mica, amber	lb.	.05
Rubber lacquer No. 105	gal.	3.00
Starch, corn, pwd.	100 lbs.	2.49 / 2.60
potato	lb.	.03¾/ .04½

Talc, dusting	ton		
Pyrax A	ton		
Latex Compounding Ingredients			
Accelerator 552	lb.		
Aquarex	lb.		
Catalpo	ton		
Colloidal color pastes	lb.		
sulphur	lb.		
zinc oxide	lb.		
Disinfectants	lb.		
Dispersaid	lb.		
Dispersed Antox	lb.		
Emulsified Heliozone	lb.		
Neozone L	lb.		
Tepidone	lb.		
Mineral Rubber			
Genasco (fact'y)	ton	30.00	/32.00
Gilsonite (fact'y)	ton	37.34	/39.65
Granulated M. R.	ton		
Hydrocarbon, granulated	ton	40.00	/42.00
hard	ton		
Parmr Grade 1	ton		
Grade 2	ton		
Mold Lubricants			
Sericite	ton		
Soapbark (cut)	lb.	.07	/ .08
Soapstone	ton		
Oils			
Castor, blown	lb.	.11¼/	.11¾
Poppy seed	gal.	1.55	/ 1.60
Red, distilled (bbls.)	lb.	.07	/ .07⅝
Protective Colloid			
Casein, domestic	lb.	.11¾/	.12½
Reenforcers			
Carbon Black			
Aerfloted arrow black	lb.	.02¾	
Arrow specification black	lb.	.03	
Century (works, c. l.)	lb.	.0282	
Certified, Cabot, c. l., f. o. b. works, bags	lb.	.02¾	
c. l., f. o. b. works, cases	lb.	.04¼	
l. c. l., f. o. b. works	lb.	.04¾	
Spheron (Dense Dustless Black) c. l., f. o. b. works	lb.	.02¾	
Disperso (works, c. l.)	lb.	.0282	
Dixie brand	lb.	.0272/	.06½
Kosmos brand	lb.	.0272/	.06½
Micronex	lb.		
Ordinary (compressed or uncompressed)	lb.		
Clays			
Blue Ridge, dark	ton		
China	ton		
Dixie	ton		
Langford	ton		
Par	ton		
Perfection	ton	20.00	
Standard	ton		
Suprex No. 1	ton	8.00	
No. 2, dark	ton	6.50	
Glue, high grade	lb.	.17	/ .22
Reordorants			
Amora A	lb.		
B	lb.		
C	lb.		
D	lb.		
Rodo	lb.		
Rubber Substitutes or Factice			
Amberex	lb.	.14	
Black	lb.	.06	/ .08
Brown	lb.	.06½/	.11
White	lb.	.07½/	.12
Softeners			
Burgundy pitch	lb.	.05	
Hardwood pitch, c.l.	ton	24.00	/25.00
Palm oil (Witco)	lb.	.07	
Petrolatum, light amber	lb.	.02⅜/	.02½
Pine tar	gal.	.25	
Plastogen	lb.		
Rosin oil, compounded	gal.	.30	
Rubtack	lb.	.10	
Tonox	lb.		
Witco Flux	gal.	.20	
Solvents			
Benzol (90% drums)	gal.	.27	
Bondogen	gal.		
Carbon bisulphide (drums)	lb.	.05½/	.12
tetrachloride	lb.	.05¼/	.06
Turpentine, steam distilled	gal.	.44	/ .45
Stabilizers for Cure			
Laurex, ton lots	lb.		
Stearex B	lb.		
flake	lb.		
Stearic acid, dbl. pres'd	lb.		
Zinc stearate	lb.		
Vulcanizing Ingredients			
Sulphur			
Chloride, drums	lb.	.03½/	.04
Flowers, extrafine refined, U.S.P.	100 lbs.		
Rubber	100 lbs.		
Telloy	lb.		
Vandex	lb.		

(See also Colors--Antimony)

IMPORTS, CONSUMPTION, AND STOCKS



United States Stocks, Imports, and Consumption

United States and World Statistics of Rubber Imports, Exports, Consumption, and Stocks

Twelve Months	U. S. Net Imports* Tons	U. S. Consumption Tons	U. S. Stocks on Hand† Tons	U. S. Stocks Afloat† Tons	United Kingdom Stocks†‡ Tons	Singapore and Penang, Etc., Stocks†‡ Tons	World Production (Net Exports)‡ Tons	World Consumption Estimated‡ Tons	World Stocks†‡§ Tons
1930	488,343	375,980	200,998	56,035	118,297	45,179	821,815	684,993	366,034
1931	495,163	348,986	322,825	40,455	127,103	55,458	797,441	668,660	495,724
1932	400,787	322,000	379,000	38,360	92,567	36,802	709,860	670,250	518,187
1933									
January	31,110	22,906	385,811	32,539	89,050	35,746	63,951	52,120	521,173
February	18,875	21,638	381,794	32,898	90,172	34,354	56,056	54,900	518,166
March	27,879	18,047	390,135	29,531	94,565	34,089	61,932	59,100	518,812
April	19,459	26,226	382,167	30,745	95,066	33,520	57,180	61,300	510,753
May	27,556	44,580	364,623	43,342	......	......	......	......	......

*Including liquid latex, but not guayule. †Stocks on hand the last of the month or year. ‡W. H. Rickinson & Son's figures. §Stocks at the 3 main centers, U. S. A., U. K., Singapore and Penang.

Tire Production Statistics

	Pneumatic Casings—All Types		
	Inventory	Production	Total Shipments
1931	6,219,776	38,992,220	40,048,552
1932	6,115,487	32,067,732	32,200,820
1933			
Jan.	5,789,476	1,806,277	2,077,268
Feb.	5,901,557	1,871,498	1,833,970
Mar.	5,831,981	1,630,319	1,673,502
Apr.	5,418,979	2,498,795	2,923,154
	Inner Tubes—All Types		
1931	6,337,570	38,666,376	40,017,175
1932	5,399,551	29,513,246	30,328,536
1933			
Jan.	4,957,298	1,674,557	2,028,100
Feb.	5,085,321	1,778,818	1,681,853
Mar.	5,095,340	1,506,141	1,521,736
Apr.	4,951,399	2,282,298	2,440,555
	Solid and Cushion Tires		
1931	38,815	136,261	167,555
1932	23,830	97,089	108,581
1933			
Jan.	21,956	5,536	6,868
Feb.	......	6,829	7,920
Mar.	......	6,795	6,622
Apr.	......	7,149	7,766

	Cotton and Rubber Consumption Casings, Tubes, Solid and Cushion Tires		Consumption of Motor Gasoline (100%)
	Cotton Fabric Pounds	Crude Rubber Pounds	Gallons
1931	151,143,715	456,615,428	16,941,750,000
1932	128,981,222	416,577,533	15,698,340,000
1933			
Jan.	7,899,233	27,368,276	1,110,564,000
Feb.	7,263,337	25,123,700	979,608,000
Mar.	6,364,276	21,508,416	1,186,122,000
Apr.	10,460,327	35,169,724	1,267,392,000

Rubber Manufacturers Association, Inc., figures representing approximately 80% of the industry with the exception of gasoline consumption.

CONSUMPTION of crude rubber by manufacturers in the United States for May was 44,580 long tons, the highest consumption figure for any one month since May, 1929. This compares with 26,226 long tons for April, an increase of 70% according to R.M.A. statistics. Consumption for May, 1932, totaled 30,957 long tons. For first 5 months of 1933 consumption amounted to 133,398 long tons, compared with 149,449 long tons for the same period in 1932.

Imports of crude rubber for May were 27,556 long tons, an increase of 41.6% over April, but 14.5% below May, 1932.

Total domestic stocks of crude rubber on hand May 31 are estimated at 364,459 long tons against April 30 stocks of 382,167 long tons. May stocks decreased 4.6% compared with April, but were 8.2% above the stocks of May 31, 1932.

Crude rubber afloat for United States ports on May 31 was 43,342 long tons, compared with 30,745 long tons afloat on April 30, and 50,453 long tons afloat on May 31, 1932.

London and Liverpool Stocks

Week Ended	London (Tons)	Liverpool (Tons)
May 27	41,968	56,795
June 3	42,457	57,560
June 10	42,723	58,560
June 17	43,361	59,326
June 24	44,043	59,272

COTTON AND FABRICS

THE approach of the Economic Conference in London and uncertainty over what plan the Secretary of Agriculture would adopt for the relief of the cotton farmer was responsible for recessions from the high ground reached by quotations last month. In the June 24 week, however, favorable reports were received on both these counts, and the market recovered by 50 points to show a gain for the first 4 weeks of June.

The result feared most from the Conference was that the dollar would be stabilized with the pound on a level that would make any further advance in commodity prices unlikely. When President Roosevelt announced that the American delegation was not ready at this time to discuss stabilization, the market firmed considerably.

Manufacturers have long been campaigning against the impending processing tax. The record rate of production reveals to what extent they are building up stocks before the tax becomes effective. Some commentators feel that the 4¢ tax will not make much difference in the finished cost if prices go higher, but mills are making no commitments after August 1 without clauses protecting them against the tax.

The expected reduction of 10,000,000 acres in the present crop depends on the acceptance by a sufficient number of growers of the bounty offered by the government either in cash or government cotton. The amount of the tax has been held in abeyance until it is ascertained if enough farmers will join the plan. At first the success of the plan was doubtful, but by the end of a week reports from various sections of the cotton belt indicated that it might succeed after all. The only drawback is that higher prices may make the idea less acceptable to growers. But if the lack of rain continues, it might be more advantageous to fall in with the movement. Growers have until July 1 to accept.

The tremendous activity in mills is certainly cheerful news. Not only has production reached record levels, but orders on hand are sufficient in many cases to carry operations at capacity forward for from 4 to 6 months. Thousands of employes have been recalled; and if the shorter week is adopted, it should mean capacity production for some time.

Week ended June 3. After hitting new highs for the season, cotton prices receded on reports of a large crop this season. Early in the week came rumors that 25% of the cotton acreage would be withdrawn under a plan of the Farm Relief Bill for leasing farm lands. Heavy profit-taking also was a weight on prices, but after cotton advanced 135 points in a week it was expected that speculators would take their profits.

COTTON BULL POINTS

1. **Secretary Wallace announced a plan for 25% reduction of the 1933 crop, dependent upon cooperation by a sufficient number of growers.**
2. **Forwardings to mills reached new high levels in June, far above previous records.**
3. **May consumption of cotton was 620,909 bales, against 470,685 in April, and 332,372 in May, 1932.**
4. **Cloth business is said to exceed the peak reached in the Fall of 1929, with orders for several months ahead.**
5. **World consumption of American cotton will be 13,800,000 to 14,000,000 bales this season, against 12,506,000 last season.**
6. **Cotton on hand in public storage and consuming establishments on May 31 was 8,715,560 bales of lint against 9,614,673 in May, 1932.**
7. **Japan will not purchase Indian cotton because of a 50% duty increase. This move will probably mean an increase in sales of American cotton.**
8. **The R. F. C. loan of $50,000,000 to China will enable it to buy approximately 900,000 bales of our cotton.**
9. **Rain is needed in much of the cotton belt.**
10. **May spinning activity was 112.3% of capacity, against 63.3% in May, 1932.**

COTTON BEAR POINTS

1. **A continued rise in prices may change the attitude of farmers now willing to retire cotton acreage under the recovery plan of Secretary Wallace.**
2. **The present crop is estimated at 13,000,000 to 14,500,000 bales by private forecasters.**
3. **The July 31 carryover will exceed 12,000,000 bales, a record except for last season.**
4. **Fertilizer sales for the season in 9 states are far ahead of a year ago.**
5. **The processing tax, part of the plan for financing a cut of 25% in 1933 acreage, has been opposed by almost all manufacturers that will be affected.**
6. **Exports are almost 700,000 bales below last season's, though growing steadily.**

WEEKLY AVERAGE PRICES OF MIDDLING COTTON

Week Ended	Cents per Pound
May 27	8.73
June 3	9.23
June 10	9.23
June 17	9.24
June 24	9.41

Since last Saturday, prices declined from 7 to 12 points. July closed at 9.01¢, compared with 9.09¢ the week before; October 9.25 against 9.34; December 9.41 against 9.50; January 9.47 against 9.59; March 9.64 against 9.74; and May 9.80 against 9.96. On several occasions the new May position sold over 10¢.

The only definite plan reported under the new bill was a reduction of 30% by growers who would share in the pool of 2,500,000 bales of government financed cotton.

The Red Cross asked for bids on 100,000 bales more of its cotton, which with the 88,000 bales recently sold would wipe out practically all of the government-owned cotton in New York warehouses.

A private estimate put the present crop's condition at 68, compared with a 10-year average of 73.5. Putting the increase in acreage at 9.4%, the yield was given as 13,090,000 bales. Another report gave a crop of 14,500,000 bales. These figures point to a carryover of 12,000,000 bales on July 31, which would be a record except for last year. Feed crops in the Southwest were said to have failed, and the tendency was to plant cotton as the planting season nears its close.

Forwardings to domestic mills is at a record high. For last week it was 163.0, according to *The New York Times'* index, against 154.7 in the previous week and 70.1 for the corresponding week a year ago. Trading slackened somewhat because mills and buyers are awaiting the outcome of the industry's request for a 40-hour work week. Prices held steady. The excise tax is still a factor to be reckoned with, and retailers are making every effort to protect themselves against such a tax.

The decline last week was limited by news that a meeting was being held in Washington to consider measures to carry out the recent farm legislation.

Week ended June 10. A number of factors affected the cotton market during the week, with the result that prices moved on both sides of the level reached last week, but managed to close with slightly higher prices. Rumors about the land-leasing provisions in the farm bill received much attention along with the process tax on consumers of raw materials. Crop reports were good, with some plants blooming the earliest in 20 years. Forwardings to mills reached a figure higher than the 1929 level, probably owing to a fear of the processing tax.

At the end of the week prices were from 23 to 24 points higher than last Saturday's. July closed at 9.26¢, compared with 9.01¢ the week before; October 9.50 against 9.25; December 9.66 against 9.41; January 9.72 against 9.47; March 9.88 against 9.64; and May 10.04 against 9.80.

A sustaining bit of news was the announcement of the $50,000,000 credit to China for the purchase of American cotton and wheat. China will buy about 900,000 bales of our surplus cotton with the money.

Forwardings of cotton to domestic mills last week was 154,000 bales, compared with 135,000 in the preceding week, and 93,000 in the best week during June, 1929. The *Times'* index reached the "astonishing level" of 181.7 for June 3, against 163.0 for the preceding week and 60.2 for the corresponding period in 1932.

Week ended June 17. Uncertainty over the method of farm relief to be employed under the agricultural adjustment program unsettled cotton prices all week. On Thursday when the stock market broke, large selling was prompted in cotton by the view that a decision had been reached on the tax. Prices dropped 38 to 44 points. Half the loss was recovered Friday, but lost again Saturday so

that prices were from 30 to 31 points down at the week-end.

July closed at 8.96¢, compared with 9.26¢ last Saturday; October 9.19 against 9.50; December 9.35 against 9.66; January 9.41 against 9.72; March 9.56 against 9.88; and May 9.70 against 10.04.

Fear of the tax has resulted in unprecedented activity in domestic mills. Forwardings reached another new high last week, with *The Times'* index rising to 222.7 for the June 10 week, compared with 181.7 in the previous week and 58.7 for the same week last year.

Consumption of cotton in May, the highest of any month since October, 1929, reached 620,909 bales, compared with 470,685 in April and 332,372 in May, 1932. For the 10 months of the season consumption was 4,838,910 bales against 4,269,664 in the same period last season.

Exports in May were 591,647 bales, compared with 500,871 in May, 1932, and 335,796 in May, 1931. Exports for 10 months are about 700,000 bales behind last year.

In commenting on the record rate of activity which compares favorably with that of the 1926-27 season, the New York Cotton Exchange Service said: "It appears probable that world consumption of American cotton this season will be about 13,800,000 to 14,000,000 bales, compared with 12,506,000 last season, 11,113,000, 2 seasons ago, 13,021,000, 3 seasons ago, and 15,226,000, 4 seasons ago. Consumption of foreign cottons will be about 10,800,000 to 10,900,000 bales, against 9,658,000 last season, 11,317,000, 2 seasons ago, 11,881,000, 3 seasons ago, and 11,115,000, 4 seasons ago."

Week ended June 24. The 1933 peak in cotton prices was reached in the last week, but profit-taking softened prices on almost every rise. The American statement at the Economic Conference that the United States was against stabilization of currency at this time gave an impetus to quotations. Definite announcement of the plan, made by Secretary Wallace, under which cotton acreage is to be reduced, was also favorably received, except that the proposed processing tax was frowned on by manufacturers.

At the close of the week, prices were higher by 50 to 58 points. The July contract closed at 9.46¢, compared with 8.96¢ the week before; October 9.74 against 9.19; December 9.89 against 9.35; January 9.98 against 9.41; March 10.14 against 9.56; and May 10.28 against 9.70.

Under the program of the Agricultural Adjustment Administration, Secretary Wallace announced plans for destroying 25% of the 1933 cotton acreage, to be financed through a processing tax. The plan hinges on acceptance of the cut by enough growers to take out at least 10,000,000 acres of land now planted to cotton. The amount of the tax will be determined after it has been ascertained whether the acreage cut can be realized.

The tax was violently opposed, but as the week progressed, reports showed that at least in certain sections the required amount of cotton would be plowed under. From Texas came news that the quota for the Southwest would be realized; private reports estimated that 1,000,000 of the 4,000,000 acres in Arkansas would be destroyed. The only difficulty is that if prices continue to rise, farmers may reconsider.

The crop weather has been good so far, but rains are needed in a steadily expanding area.

Mills are still operating at full capacity. Forwardings last week were 175,000 bales, against 167,000 in the previous week and 40,000 for the June 18 week in 1932. Production is being pushed to avoid the processing tax and to build up stocks before the new code is effective, which will increase salaries and reduce working hours. The index of *The New York Times* was 251.3 for forwardings in the June 17 week, compared with 222.7 for the week before and 58.1 for the same week last year.

The government campaign for acreage reduction and reports that world consumption of American cotton during May was the largest since October, 1929, caused a strong bullish sentiment in cotton futures on June 26, and prices rocketed 83 to 85 above Saturday's close. July contract closed at 10.40¢ against 9.46¢ on Saturday; August 10.36 against 9.52; September 10.49 against 9.66.

New York Quotations

June 26, 1933

		Cents
Drills		
38-inch 2.00-yard	yd.	$0.13
40-inch 3.47-yard		.08
50-inch 1.52-yard		.18
52-inch 1.90-yard		.14½
52-inch 2.20-yard		.12½
52-inch 1.85-yard		.14⅞
Ducks		
38-inch 2.00-yard D. F.	yd.	.13
40-inch 1.45-yard S. F.		.18
72-inch 1.05-yard D. F.		.24¾
72-inch 16.66-ounce		.29-1/5
72-inch 17.21-ounce		.30⅛
MECHANICAL		
Hose and belting	lb.	.28
TENNIS		
52-inch 1.35-yard	yd.	.20¾
***Hollands**		
GOLD SEAL		
30-inch No. 72	yd.	.16
40-inch No. 72		.17½
RED SEAL		
30-inch	yd.	.13½
40-inch		.14½
50-inch		.20
Osnaburgs		
40-inch 2.34-yard	yd.	.10¾
40-inch 2.48-yard		.10
40-inch 3.00-yard		.08-1/3
40-inch 10-ounce part waste		.13¾
40-inch 7-ounce part waste		.09⅝
37-inch 2.42-yard		.10-1/3
Raincoat Fabrics		
COTTON		
Bombazine 60 x 64	yd.	.10
Bombazine 60 x 48		.09
Plaids 60 x 48		.09¾
Plaids 48 x 48		.08¾
Surface prints 60 x 64		.10¾
Surface prints 60 x 48		.09¾
Print cloth, 38½-inch, 64 x 60		.05¾
Print cloth, 38½-inch, 60 x 48		.05¼
SHEETINGS, 40-INCH		
48 x 48, 2.50-yard	yd.	.09
48 x 48, 2.85-yard		.08
64 x 68, 3.15-yard		.08¾
56 x 60, 3.60-yard		.08
44 x 48, 3.75-yard		.06⅝
44 x 40, 4.25-yard		.06
SHEETINGS, 36-INCH		
48 x 44, 5.00-yard	yd.	.05¼
44 x 40, 6.15-yard		.04½
Tire Fabrics		
BUILDER		
17¼ ounce 60″ 23/11 ply Karded peeler	lb.	.28
17¼ ounce 60″ 10/5 ply Karded peeler	lb.	.25
CHAFER		
14 ounce 60″ 20/8 ply Karded peeler	lb.	.28
12 ounce 60″ 10/4 ply Karded peeler	lb.	.25
9¼ ounce 60″ 20/4 ply Karded peeler	lb.	.29
9¼ ounce 60″ 10/2 ply Karded peeler	lb.	.26
CORD FABRICS		
23/5/3 Karded peeler, 1 1/16″ cotton	lb.	.29
23/4/3 Karded peeler, 1 1/16″ cotton	lb.	.30
15/3/3 Karded peeler, 1 1/16″ cotton	lb.	.27
13/3/3 Karded peeler, 1 1/16″ cotton	lb.	.26
7/2/2 Karded peeler, 1 1/16″ cotton	lb.	.24
23/5/3 Karded peeler, 1¼″ cotton	lb.	.37
23/5/3 Karded Egyptian, Egyptian upper cotton	lb.	.42
23/5/3 Combed Egyptian	lb.	.47
LENO BREAKER		
8¼ ounce and 10¼ ounce 60″ Karded peeler	lb.	.25

*Prices for 1,200 yards of a width or over.

Cotton Fabrics

Ducks, Drills, and Osnaburgs. In the past month a keen demand developed for textiles both for immediate delivery and forward contracts. Sellers were reluctant to respond until such matters as maximum working hours and minimum wage ruling have been fixed. Textile prices have responded encouragingly to the efforts of the administration to stimulate consumption. The conservative policy of sellers will continue until after mid-July, by which time it is expected that some of the conditions to govern operation of the textile industry will have been determined. Meantime prices are gradually advancing to include the new elements, making for increase in cost. Buyers are showing interest in anticipating their future needs.

Raincoat Fabrics. The raincoat business is more or less stagnant at present owing to changing styles for the next season. The manufacturers are busy selecting their lines for the fall trade. They are looking forward to good fall business, at which time they will display attractive prints and plain material raincoats.

Sheetings. For the past 12 weeks sales have exceeded the average of full production, with prices advancing. They are now at the highs for the current movement.

The new plan of manufacturing under the Industrial Recovery Act should have a very beneficial effect in the textile industry.

Tire Fabrics. Prices on all grades of tire cords advanced sharply at the middle of June, and these increases have been firmly maintained in conformity with similar upward price changes prevailing generally in the textile industry.

RUBBER SCRAP

SCRAP rubber is in very good demand at present, although collections are not large enough to meet the many calls. The reason is that, while prices have been raised in the last 2 months, they are still unprofitable to dealers. Boots and shoes, for instance, require a tremendous amount of grubbing to net a junk dealer enough scrap to pay him for a day's work. At $1 to $1.10 for 100 pounds, accumulated in dribs and drabs, it can be seen that the margin is no incentive for the effort required. Mechanicals are in the same class. Mechanical scrap must be gathered in such small units it takes much time and effort to aggregate enough to make it pay. Tires and tubes are much easier to gather because of their bulk and availability. Right now dealers can just about clear expenses by working a limited territory. As prices rise, the extent of this territory will be widened; thus collections will come nearer to satisfying demand.

Prices advanced again this month, many of them by sizable amounts. Tires and tubes advanced from $1 to $3 on some grades.

BOOTS AND SHOES. This grade of scrap is still in the forefront as far as activity is concerned. Consumer demand is good and has done better than expected, even in the present good season. Prices advanced from 25¢ to 50¢. As mentioned above, quotations are still too low to be attractive to dealers so that collections do not meet demands.

TIRES. Carcasses and solid trucks jumped $3 in the last month, and the other grades were practically $1 better. Automobile production has met no seasonal slump as yet, and the number of tires sold is heartening to manufacturers, as evidenced by increased prices and salaries. Because solid tires are almost obsolete, this form of scrap is in great demand. On the other grades collections are improving with every price gain.

TUBES. Tubes are doing as well as tires as would be expected. All grades increased from ½ to 1¢ a pound.

MECHANICALS AND HARD RUBBER. Mechanicals took part in the general price advance, but hard rubber prices showed no change.

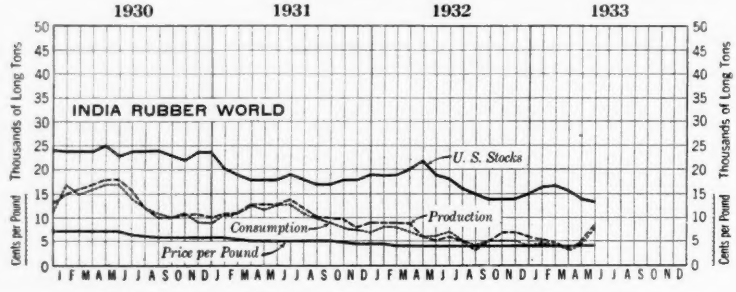
CONSUMERS' BUYING PRICES

(Carload Lots Delivered Eastern Mills)

June 26, 1933

		Prices
Boots and Shoes		
Boots and shoes, black	100 *lb.*	$0.01
Colored	100 *lb.*	.75/.875
Untrimmed arctics	100 *lb.*	.75/.875
Inner Tubes		
No. 1, floating	*lb.*	.03¼/.03½
No. 2, compound	*lb.*	.02 /.02¼
Red	*lb.*	.02 /.02⅜
Mixed tubes	*lb.*	.01¾
Tires (Akron District)		
Pneumatic Standard		
Mixed auto tires with beads	*ton*	9.75 /10.00
Beadless	*ton*	14.00 /14.50
Auto tire carcass	*ton*	10.00 /11.00
Black auto peelings	*ton*	20.00 /22.00
Solid		
Clean mixed truck	*ton*	29.00 /30.00
Light gravity	*ton*	28.00 /29.00
Mechanicals		
Mixed black scrap	*lb.*	.00½/.00¾
Hose, air brake	*ton*	7.00 / 8.00
Garden, rubber covered	*ton*	7.00 / 8.00
Steam and water, soft	*ton*	7.00 / 8.00
No. 1 red	*lb.*	.01½/.01⅝
No. 2 red	*lb.*	.01⅛/.01¼
White druggists' sundries	*lb.*	.01½/.01¾
Mechanical	*lb.*	.00⅞/.01
Hard Rubber		
No. 1 hard rubber	*lb.*	.06⅜/.06½

RECLAIMED RUBBER



Production, Consumption, Stocks, and Price of Tire Reclaim

United States Reclaimed Rubber Statistics—Long Tons

Year	Production	Consumption	Consumption Per Cent to Crude	United States Stocks*	Exports
1930	157,967	153,497	41.5	24,008	9,468
1931	132,462	125,001	35.7	19,257	6,971
1932	75,656	77,500	23.3	21,714	3,536
1933					
January	5,301	4,811	21.0	16,262	130
February	4,578	4,363	20.2	16,570	178
March	3,847	3,454	19.1	15,496	353
April	4,617	4,407	16.8	14,370	165
May	8,366	7,770	17.4	13,734	319

* Stocks on hand the last of the month or year.
Compiled by The Rubber Manufacturers Association, Inc.

A DECIDED change for the better in the last 2 months has resulted in capacity production in practically all factories using reclaim rubber, has increased consumption sharply, and has influenced many long absent buyers to come into the market.

Let the figures speak for themselves. Production from April to May jumped about 100%. Consumption increased slightly more than 75%. Stocks on hand at the end of May were only 13,734 tons, compared with an average of 21,714 tons in 1932, 19,257 in 1931, and 24,008 in 1930.

The ratio of reclaim to crude, however, moved up only slightly. Crude consumption took a leap forward, too, about 70%, and the ratio at the end of May was 17.4 against 16.8 the month before. But that doesn't give the whole story. Crude rubber prices have increased by over 50% in the last 2 months, but the price of reclaim has risen very little. As the spread widens between the 2 grades, the popularity of reclaim is bound to climb back slowly to its former level.

The jump in crude consumption was principally due to the sharp rise in tire output and automobile production. The use of reclaim in tires is limited, but the bulk of crude rubber used naturally sends crude consumption to high figures. Since the increased activity, however, has extended to all lines, the weight of the manufacturers who use a large percentage of reclaim should soon be reflected in the reclaim ratio.

The building industry is slow to get started so that wire manufacturers are not so busy as others. Shoes continue on an excellent plane, and automobile accessories are selling well. The steady gain in automobile and tire sales promises fair to keep on past the usual seasonal slump. That much-talked-about backlog of replacements in tires may be uncovered if the plans of the administration bring about the results expected. Refrigeration lines and mechanicals are also improving.

The only price changes were in black high tensiles and white auto tire reclaim. Both were ¼¢ higher.

New York Quotations

June 26, 1933

	Spec. Grav.	Cents per Lb.
High Tensile		
Super-reclaim, black	1.20	5½/5¾
red	1.20	5 /5¼
Auto Tire		
Black	1.21	3¾/4
Black selected tires	1.18	4 /4¼
Dark gray	1.35	5 /5¼
White	1.40	6½/6¾
Shoe		
Unwashed	1.60	4¾/5
Washed	1.50	5½/5¾
Tube		
No. 1	1.00	6½
No. 2	1.10	4½/4¾
Truck Tire		
Truck tire, heavy gravity	1.55	5 /5¼
Truck tire, light gravity	1.40	5¼/5½
Miscellaneous		
Mechanical blends	1.60	3¼/3½

CLASSIFIED ADVERTISEMENTS

SITUATIONS WANTED

CALENDER AND MILL ROOM FOREMAN, THOROUGH PRACtical experience on mechanicals, tires and tubes. Efficient manager with executive ability. At present employed in responsible position with large rubber company. Desires new permanent connection. Best of reasons for seeking change. A-1 references from past and present employers. Would go abroad. Address Box No. 233, care of INDIA RUBBER WORLD.

FACTORY MANAGER AND DEVELOPMENT MAN, EXPERIENCED in both soft and hard rubber mechanicals, calenders, mills, and presses. Knowledge of compounding. Reputed excellent handler of men. Address Box No. 234, care of INDIA RUBBER WORLD.

COMPOUNDER, CHEMIST, AND DEVELOPMENT MAN: 9 YEARS of experience covering wide range of rubber products. Experience includes laboratory, factory control, and development of manufacturing processes. Have held responsible executive positions. College graduate. Married. A-1 references. Address Box No. 235, care of INDIA RUBBER WORLD.

SALESMAN-MANAGER: OVER 15 YEARS' SUCCESSFUL SALES background, mechanical rubber goods, desires to represent manufacturer. Large following, thoroughly acquainted with trade, jobbers, and national accounts. New York Metropolitan Area. Excellent references. Address Box No. 240, care of INDIA RUBBER WORLD.

SITUATIONS WANTED—Continued

ACCOUNTANT-OFFICE MANAGER-TREASURER: 47, CHRISTIAN, married, Protestant, excellent health, seeks connection with a large or moderate sized rubber manufacturer. Wide experience. Salary commensurate. Address Box No. 236, care of INDIA RUBBER WORLD.

ASSISTANT SUPERINTENDENT OR GENERAL FOREMAN OF A rubberizing plant on auto topping, hospital sheeting, raincoat fabrics, shower curtains, quarter lining, and novelty goods. Address Box No. 237, care of INDIA RUBBER WORLD.

SITUATION OPEN

WANTED: EXPERIENCED SALESMEN WITH GOOD CONNECtions on rubber surface clothing for Chicago and other territories. Address Box No. 239, care of INDIA RUBBER WORLD.

BUSINESS OPPORTUNITIES

OCCASIONAL TECHNICAL CONTRIBUTIONS ON DEVELOPMENTS in United States rubber and asbestos manufacturing practice, with or without illustrations, preferably short and to the point, required by the *India-Rubber Journal*, 37 & 38, Shoe Lane, London, England.

Attention!

Chemists and Chemical Engineers of the New York Metropolitan Area

YOUR Committee on Unemployment and Relief sends you this Message through the Courtesy of INDIA RUBBER WORLD.

Every chemist or chemical engineer with a regular income, no matter how small, can contribute something each month. The amount you are able to give is not the true measure of the value of your contribution. If you've ever been out of a job, you know that's when you need friendly encouragement most.

Send your share in regularly each month, no matter how small it has to be. Make checks payable to R. T. BALDWIN, Treasurer.

COMMITTEE ON UNEMPLOYMENT AND RELIEF FOR CHEMISTS AND CHEMICAL ENGINEERS

300 Madison Ave., New York, N. Y.

FRANK G. BREYER, *Chairman*

(*Advertisements continued on page 71*)

United States Statistics

Imports of Crude and Manufactured Rubber

	March, 1933		Three Months Ended March, 1933	
UNMANUFACTURED—*Free*	Pounds	Value	Pounds	Value
Crude rubber	62,575,944	$1,867,657	180,007,061	$5,635,571
Liquid latex	1,207,608	55,731	3,911,571	202,668
Jelutong or pontianak	979,235	56,262	2,655,778	149,019
Balata	101,833	11,963	203,090	22,701
Gutta percha	29,635	3,246	168,362	13,104
Siak, scrap, and reclaimed	137,482	1,882	726,151	4,615
Totals	65,031,737	$1,996,741	187,672,013	$6,027,678
Chicle, crude .... *Free*	449,881	$134,952	1,243,849	$351,082
MANUFACTURED—*Dutiable*				
Rubber soled footwear with fabric uppers .... *pairs*	2,074,800	$303,842	3,362,472	$480,277
Rubber toys	......	32,705	......	84,826
Druggists' sundries, n. e. s	......	2,823	......	18,366
Combs, hard rubber.. *number*	426,696	12,082	1,527,882	43,724
Golf balls .... *number*	139,944	29,041	182,460	37,671
Tennis and other rubber balls .... *number*	394,608	11,329	897,508	32,431
Tires .... *number*	524	1,237	16,461	75,969
Other rubber manufactures	......	40,024	......	96,224
Totals	......	$433,083	......	$869,488

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber	2,524,523	$86,290	8,697,939	$303,259
Balata	23,300	3,317	53,805	9,073
Guayule	3,400	408	3,400	408
Gutta percha, rubber substitutes, and scrap	4,712	730	7,249	1,109
Rubber manufactures	......	1,685	......	2,696
Totals	......	$92,430	......	$316,545

Exports of Domestic Merchandise

RUBBER AND MANUFACTURES				
Reclaimed	789,797	$30,464	1,479,048	$53,439
Scrap	3,574,025	42,647	9,855,552	139,303
Rubberized automobile cloth, *sq. yd.*	57,191	21,680	133,074	56,113
Other rubberized piece goods and hospital sheeting. *sq. yd.*	35,692	11,397	119,168	42,107
Footwear				
Boots .... *pairs*	4,879	10,217	12,109	24,297
Shoes .... *pairs*	8,223	3,312	20,953	9,908
Canvas shoes with rubber soles .... *pairs*	33,208	18,803	67,746	40,105
Soles .... *doz. pairs*	1,212	2,248	2,633	5,668
Heels .... *doz. pairs*	20,228	11,156	67,548	37,616
Water bottles and fountain syringes .... *number*	12,501	5,201	46,138	15,921
Gloves .... *doz. pairs*	5,339	10,015	14,305	28,369
Other druggists' sundries	......	26,299	......	74,933
Balloons .... *gross*	14,283	14,617	51,163	45,856
Toys and balls	......	1,818	......	5,044
Bathing caps .... *doz.*	11,372	17,114	17,251	27,443
Bands	20,008	5,370	56,501	15,670
Erasers	25,941	13,471	59,862	32,873
Hard rubber goods				
Electrical goods	94,817	9,705	197,848	19,908
Other goods	......	8,940	......	20,645
Tires				
Truck and bus casings, *number*	10,241	158,628	28,300	441,508
Other automobile casings, *number*	67,314	428,719	185,711	1,254,509
Tubes, auto .... *number*	44,029	40,222	117,256	114,345
Other casings and tubes, *number*	1,336	2,965	4,236	10,088
Solid tires for automobiles and motor trucks. *number*	596	16,905	1,522	39,917
Other solid tires	56,513	6,973	227,117	24,899
Tire sundries and repair materials	......	32,147	......	81,695
Rubber and friction tape	53,095	10,652	129,393	27,582
Belting	146,269	63,157	405,892	176,192
Hose	188,192	49,333	588,882	144,730
Packing	118,903	37,955	236,980	87,789
Thread	132,020	73,371	402,368	208,202
Other rubber manufactures	......	61,216	......	196,295
Totals	......	$1,246,717	......	$3,502,969

Dominion of Canada Statistics

Imports of Crude and Manufactured Rubber

	March, 1933		Twelve Months Ended March, 1933	
UNMANUFACTURED	Pounds	Value	Pounds	Value
Rubber, gutta percha, etc	2,495,930	$92,576	41,077,906	$1,693,257
Rubber, recovered	347,700	14,310	4,263 100	169,504
Rubber and gutta percha scrap	80,900	1,628	1,524,900	22,202
Balata	1,243	485	15,990	4,031
Rubber substitute	11,400	2,251	202 100	30,086
Totals	2 937,173	$111,250	47,083,996	$1,919,080
PARTLY MANUFACTURED				
Hard rubber sheets and rods	9,036	$3,199	19,137	$10,457
Hard rubber tubes	......	662	......	5,040
Rubber thread not covered	9,058	7,363	116,285	93,006
Totals	18,094	$11,224	135,422	$108,503
MANUFACTURED				
Belting	......	$2,645	......	$42,787
Hose	......	4,041	......	40,388
Packing	......	2,898	......	34,087
Boots and shoes....... *pairs*	19,857	6,227	177,914	81,739
Clothing, including waterproofed	......	1,453	......	12,246
Raincoats .... *number*	3,230	7 316	14,145	42,595
Gloves	......	665	......	6,134
Hot water bottles	......	1,072	......	16,616
Tires, bicycle ...... *number*	3,480	1,110	37,239	17,855
Pneumatic .... *number*	5,504	26,121	16,486	112,805
Inner tubes ...... *number*	192	337	1,005	2,904
Solid for automobiles and motor trucks.... *number*	14	629	402	20,755
Other solid tires	......	912	......	11,763
Mats and matting	......	6 977	......	45,523
Cement	......	7,289	......	56,724
Golf balls .... *dozen*	2,985	7,231	34,138	100,989
Heels .... *pairs*	5,531	255	102,126	6,202
Other rubber manufactures	......	52,160	......	629,291
Totals	......	$129,338	......	$1,281,403
Totals, rubber imports	......	$251,812	......	$3 308,986

Exports of Domestic and Foreign Rubber Goods

	Produce of Canada Value	Reexports of Foreign Goods Value	Produce of Canada Value	Reexports of Foreign Goods Value
UNMANUFACTURED				
Waste rubber	$1,042	......	$23,498	......
MANUFACTURED				
Belting	$11,513	......	$176,243	......
Canvas shoes with rubber soles	144,659	......	641,806	......
Boots and shoes	149,405	......	1,671,951	......
Clothing, including waterproofed	8,245	......	55,995	......
Heels	20,477	......	215,312	......
Hose	3,951	......	64 107	......
Soles	22,844	......	163,926	......
Tires, bicycle	5	......	69	......
Pneumatic	260,853	......	3,022,931	......
Inner tubes	16,546	......	181,783	......
Solid	......	......	424	......
Other rubber manufactures	46,281	$2,662	427,824	$135,440
Totals	$684,779	$2,662	$6,622,371	$135,440
Totals, rubber exports	$685,821	$2,662	$6,645,869	$135 440

London Stocks, April, 1933

	Landed Tons	Delivered Tons	Stocks April 30: 1933 Tons	1932 Tons	1931 Tons
LONDON					
Plantation	3,981	3,755	40,861	61,794	86,881
Other grades	6	10	50	54	50
LIVERPOOL					
Plantation	*1,773	*1,494	*54,155	*61,387	*51,879
Total tons, London and Liverpool	5,760	5,259	95,066	123,235	138,810

*Official returns from the recognized public warehouses.

Plantation Rubber Crop Returns by Months

	Borneo (26 Companies)		Ceylon (102 Companies)		India and Burma (21 Companies)		Malaya (338 Companies)		—Netherlands East Indies— Java (60 Companies)		Sumatra (60 Companies)		Miscellaneous (8 Companies)		Total (615 Companies)	
1933	Long Tons	Index	Long Tons	Index	Long Tons	Index	Long Tons	Index	Long Tons	Index	Long Tons	Index	Long Tons	Index	Long Tons	Index
January	360	73.6	1,124	55.1	120	21.4	12,450	100.1	2,481	94.5	3,837	95.2	124	68.5	20,496	91.7
February	323	66.1	905	44.3	46	8.2	11,613	93.4	2,617	99.7	4,207	104.3	54	29.8	19,765	88.4
March	317	64.8	999	48.9	126	22.4	10,491	84.4	2,681	102.1	4,143	102.8	93	51.4	18,850	84.3
April	302	61.8	1,233	60.4	136	24.2	10,614	85.4	2 774	105.6	3,841	95.3	122	67.4	19,022	85.1
4 months ending April,																
1933	1,302	...	4,261	...	428	...	45,168	...	10,553	...	16,028	...	393	...	78,133	...
1932	1,371	...	4,512	...	591	...	49,609	...	11,107	...	16,862	...	638	...	84,690	...

NOTE: Index figures throughout are based on the monthly average for 1929=100. Issued May 25, 1933, by the Commercial Research Department, The Rubber Growers' Association, Inc., London, England.

ERNEST JACOBY

Crude Rubber
Liquid Latex
Carbon Black
Clay

Stocks of above carried at all times

BOSTON MASS.
Cable Address: Jacobite Boston

Classified Advertisements

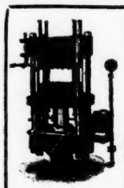
Continued

MACHINERY AND SUPPLIES FOR SALE

FOR SALE: ONE 18 BY 54" BIRMINGHAM 4-ROLL CALENDER; one unused 18 by 30" heavy duty FARREL MILL, chain drive; complete line of W. & P. Mixers, Vacuum Shelf Driers, Calenders, Mills, Colloid Mills, Pebble Mills, Dough Mixers, Hydraulic Presses, Pumps, etc. Rebuilt, guaranteed. What machinery have you for sale? CONSOLIDATED PRODUCTS CO., INC., 13-16 Park Row, New York, N. Y.

FOR SALE CHEAP: 6 HORIZONTAL 1,000-GALLON WATER jacket mixers with "V" belt drives; 2 horizontal 1,000-gallon water jacket mixers with direct drive; 1 horizontal 500-gallon mixer with chain drive, with or without motors. Address Box No. 238, care of INDIA RUBBER WORLD.

CALENDER SHELLS
ANY DIAMETER, ANY LENGTH
The W. F. Gammeter Co., Cadiz, Ohio



PLASTICS MOLDING PRESSES
Plain or Semi-automatic—Any Size or pressure—Pumps, Valves, etc.
Dunning & Boschert Press Co., Inc.
336 W. WATER ST. SYRACUSE, N. Y.

Acquire the Habit
of reading and using the classified section of INDIA RUBBER WORLD—it is full of opportunities.

MECHANICAL MOLDED RUBBER GOODS
We Solicit Your Inquiries
THE BARR RUBBER PRODUCTS COMPANY
SANDUSKY, OHIO

Druggists' Sundries—Surgical Rubber Goods
Elastic Bands—Tubing—Bladders
Rubber Footwear—Rubber Roll Covering
Hand Made and Molded Specialties
TYER RUBBER COMPANY
Main Street Andover, Mass., U. S. A.

NORMAL-CONCENTRATED-PROCESSED
Heveatex

RUBBER LATEX
Always In Stock For Immediate Delivery
HEVEATEX CORPORATION
78 GOODYEAR AVE.
MELROSE, MASS.

***Genasco* Hydrocarbon**
(SOLID OR GRANULATED)
A hard, stable compound—produced under the exacting supervision of an experienced and up-to-date laboratory.
Aging tests have proved Genasco to be *always* of uniform quality. Shipped to all parts of the world in metal drums. Stocks carried at Maurer, N. J. and Madison, Ill.
THE BARBER ASPHALT COMPANY
Philadelphia New York Chicago St. Louis

INTERNATIONAL PULP CO.
41 Park Row, NEW YORK, N. Y.
SOLE PRODUCERS
ASBESTINE
REG. U. S. PAT. OFF.

UNITED

GUARANTEED REBUILT MACHINERY
IMMEDIATE DELIVERIES FROM STOCK
MILLS, CALENDERS, TUBERS, HYDRAULIC PRESSES, PUMPS, VULCANIZERS, TIRE MAKING EQUIPMENT, MOULDS, ETC.
UNITED RUBBER MACHINERY EXCHANGE
319-323 FRELINGHUYSEN AVE. NEWARK, N. J.
CABLE ADDRESS "URME"

MR. RUBBER MANUFACTURER!
Don't hold out! Get in on
THE NEW DEAL!
Use the upper decks of your presses! Cut your overhead! Stop passing dividends! Don't stay on with a two or a three-day week, but start operating with a full house! Bridge the depression by making a bid for the rubber trade's most unsaturated market—golf balls—used in the Royal and Ancient Game. Let us assist you.
PLANT INSTALLATION AND OPERATION
PROCESSES FORMULAS EQUIPMENT DEVELOPMENT
I. T. GURMAN, CONSULTANT
CHEMICAL, MECHANICAL & INDUSTRIAL ENGINEERING
GOLF BALL SPECIALIST
1 WYETH STREET MALDEN, MASS.

Distributers' Tire Stocks

In the United States as of April 1, 1933[1]

THIS report covers stocks of tires held by both independent dealers and mass distributers. Returns from these 2 groups are discussed separately below.

Independent Dealers' Stocks

The regular semi-annual survey of tire stocks in hands of dealers, conducted since 1924 by the Rubber Division, shows the following comparable statistics, as of April 1, for stocks held by independent retailers in 1933 as against 1932. The number of reports received from dealers having stocks of casings was 2,993 less than in April, 1932. The average number of automobile casings per dealer was 64.8 on April 1, 1933, compared with 66.2 a year previous.

Dealers' Stocks of Automobile Tires

	April 1, 1932			April 1, 1933		
	No.	Dealers Reporting	Average per Dealer	No.	Dealers Reporting	Average per Dealer
Total casings	1,590,935	24,029	66.2	1,363,758	21,036	64.8
High pressure casings	202,452	16,711	12.1	155,070	13,741	11.3
Inner tubes	2,193,848	24,188	90.7	1,760,488	21,311	82.6
Solids	14,589	818	17.8	11,000	595	18.5

High pressure casings, including both passenger car and truck sizes, which accounted for 12.7% of total stocks reported April 1, 1932, amounted to only 11.4% of the total reported this year.

The following table compares average stocks per dealer reporting each item on April 1 in the years 1926 to 1933.

Average Stocks per Dealer on April 1

	1926	1927	1928	1929	1930	1931	1932	1933
Total casings	63.9	70.6	81.2	94.4	83.0	78.4	66.2	64.8
Balloon casings....	21.9	35.5	45.7	69.1	*	*	*	*
High pressure	*	*	*	*	22.4	15.6	12.1	11.3
Inner tubes	119.6	120.9	123.4	143.5	118.6	106.5	90.7	82.6
Solids, etc.	26.6	24.7	27.0	35.0	28.4	21.8	17.8	18.5

*Not tabulated separately.

An analysis by volume groups has been prepared of the reports from dealers having stocks of casings, and a comparison made to the survey of April 1, 1932.

Dealers Classified by Volume of Stock

	April 1, 1932			April 1, 1933		
	No. of Dealers	% of Total Dealers	No. of Casings	No. of Dealers	% of Total Dealers	No. of Casings
Less than 10.....	4,951	20.61	24,388	4,862	23.11	23,804
10— 24	6,640	27.63	106,520	5,849	27.81	93,939
25— 49	5,338	22.21	187,053	4,569	21.72	158,815
50— 99	3,779	15.73	257,674	3,047	14.48	208,058
100—199	1,913	7.96	258,623	1,515	7.20	205,987
200—299	572	2.38	136,424	469	2.23	112,337
300—399	275	1.15	92,993	243	1.16	83,058
400—999	428	1.78	250,080	352	1.67	214,193
1,000 and over....	133	0.55	277,180	130	0.62	263,567
	24,029	100.00	1,590,935	21,036	100.00	1,363,758

Mass Distributers' Stocks

This section covers the stocks reported by mail order houses, automotive supply chain stores, chains operated by certain oil companies which sell tires through their stations in several states, and retail stores owned or controlled by the principal tire manufacturing companies. Complete reports comparable with 1932 were received from all the above except the company-owned stores of 4 tire manufacturers; individual returns were received from 30% of the stores of these 4 companies. The following table shows the stocks actually reported by these companies, April 1, 1933, compared with the 2 preceding surveys.

Mass Distributers' Reported Stocks

	April 1, 1932	October 1, 1932	April 1, 1933
Total casings	1,592,271	2,023,929	1,503,154
Inner tubes	1,775,194	2,109,690	1,626,003
Solid and cushion tires........	4,509	2,285	2,017
High pressure casings..........	167,395	197,096	161,983

It is estimated that the total mass distributers' stocks of casings numbered 2,450,000 on October 1, 1932; and 1,815,000 on April 1, 1933. For April 1, 1932, the number of casings held by mass distributers in addition to the number included in manufacturers' stocks (as reported to The Rubber Manufacturers Association) was estimated in Circular 3,260 as 1,800,000, but the total comparable to the April 1, 1933, figure was approximately 1,900,000 casings, somewhat higher than current stocks. Mass distributers' stocks are thus shown to be about 635,000 less than on October 1, 1932, and about 85,000 less than on April 1, 1932. The total stocks of inner tubes held by mass distributers April 1, 1933, are estimated at 1,950,000, which compares with 2,475,000 on October 1, 1932.

Summary

The casings inventory of independent tire dealers is now slightly lower than on April 1, 1932, and the abnormally high inventory of October 1, 1932, has been liquidated. The "average casings per dealer" on April 1, 1932, and 1933, is at approximately the same level as in 1925-26, when the number of active independent dealers was much greater than at present.

The inner tube inventory of independent dealers is lower than that for any previous April survey made by the Rubber Division. This is clearly indicated by the "average per dealer" figures, but the reduced number of active dealers makes the shrinkage in stocks even more pronounced than revealed by these averages.

Mass distributers have likewise reduced their stocks from the abnormal figures of last October and now have a lower inventory than on April 1, 1932, both for casings and inner tubes.

Independent dealers were holding 129 inner tubes for every 100 casings on April 1; while mass distributers were holding 108 inner tubes for every 100 casings. Inner tube inventories of distributers are higher than casings inventories.

An idea of the true inventory position of the industry is given in the following statement, which is based on an assumption that there were 70,000 active independent tire dealers at the date of each of the last 3 surveys, plus estimated total stocks held by mass distributers, plus the inventory of manufacturers (incomplete) as reported by The Rubber Manufacturers Association, Inc. The statement is to be regarded as a sample of how such estimates may be made, rather than as an accurate statement.

Industry Inventory of Automobile Casings
(Thousands of Casings)

	April 1, 1932	October 1, 1932	April 1, 1933
Independent dealers	4,634	4,991	4,536
Mass distributers	1,900	2,450	1,815
Manufacturers	7,902	4,873	5,811
	14,436	12,314	12,162

[1]Special Circular No. 3,436. Rubber Division, Department of Commerce, Bureau of Foreign and Domestic Commerce, Washington, D. C.